Delaware Department of Transportation

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COLLINS, GEDDES & CO LEBANON DELAWARE

Archæological Data Recovery on the Collins, Geddes Cannery Site

by Edward F. Heite

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Number 83
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ARCHÆOLOGICAL DATA RECOVERY ON THE

COLLINS, GEDDES CANNERY SITE,

ROAD 356A, LEBANON, NORTH MURDERKILL HUNDRED,

KENT COUNTY, DELAWARE

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BY

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WITH CONTRIBUTIONS BY

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ABSTRACT

A cultural resource data recovery project was conducted in the proposed route of Road 356a in Kent County, Delaware. A collection of can-making waste, deposited between 1870 and 1882, was discovered in an area affected by the project. The discovery of this waste led researchers to the site of the Collins, Geddes cannery, which was declared eligible for listing in the National Register of Historic Places.

This is a report of excavation of that part of the cannery site that was destroyed by reconstruction of the highway. The ground plan of a principal cannery building was recovered, together with additional can waste. Interpretation included analysis of working conditions, the cannery's state of development, and the place of canning in the community. As an outgrowth of this excavation, the manufacturing theme of the State Plan for Historic Preservation was examined, and data concerning similar sites was accumulated.

ACKNOWLEDGEMENTS

SPECIAL ACKNOWLEDGEMENT is due to Dr. E. D. Bryan, of Dover, who has shared his notes, his collection, and his expertise. Much of the information about the cannery and canning has been lifted directly from Dr. Bryan's work. All the historic pictures associated with the canning industry were collected by Dr. Bryan for an exhibit and are reproduced here through the courtesy of the Delaware Division of Museums and Historic Sites.

Richard L. Haddick, of Wyoming, shared generously of his expertise, his reference materials, and his advice in the interpretation of tinsmithing evidence. Mr. and Mrs. W. Thomas Pickering, Samuel Thomas, Judith Manns, and numerous other residents of the area were helpful and solicitous at all times.

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CATSUP— The large fruit canning establishment of Collins & Co. at Labanon, near Camden, is now running day and night in manufacturing *sixty thousand gallons* of catsup for parties in Philadelphia and New York, at one dollar per gallon. The tomatoes from which this immense quantity is to be made were bought during the season and placed in immense vats, five in number, where they have been kept until fermentation was effected, and are now being put through the other processes of boiling, squeezing through sieves, peppering, &c. This, when we reflect that it will be 500 hogsheads of this red-hot condiment, ought to be enough to parch the palates of all humanity.

— *Smyrna Times*
November 19, 1873

CHAPTER 1

INTRODUCTION

CATSUP TODAY hardly qualifies for the superlatives lavished upon it by the *Smyrna Times* correspondent. Modern catsup is neither hot nor fermented, but it comes in bottles strikingly similar to those used by the Collins cannery more than a century ago. Both taste and processing methods have changed during the intervening generations, while the name and the package have remained static.

It is not sufficient to state the name of something and assume that the name has the same meaning to all readers, at all times. Catsup has changed, as the recipes on page 8 will show. So has food preservation technology.

In the nineteenth century, a cannery was a place where cans were made and filled with locally-grown products. Can filling was a seasonal business, but can making was a year-round job. Cannery managers were more likely to be tinsmiths than food experts, and profits were extremely high. The seasonal labor force consisted largely of young ladies, who lived during the season on the grounds in a [properly chaperoned] dormitory on the property. The year-round force were can-makers, who worked during the harvest season closing the cans they had manufactured during the winter.

PLATE 1

Ærial view of the Lebanon cannery site, from the southwest before construction of the new Road 356a. The duplex apartment house, at extreme right, stands on the south end of the cannery site. Photo by Tim O'Brien, 1987

Around 1900, can manufacture became a separate business; canners began buying their cans ready-made, eliminating the need to maintain a year-found factory. During the first decade of the twentieth century, canneries changed. They were no longer year-round operations; only a maintenance crew remained on the site over the winter. There was no longer any need for weather-tight factory buildings, and canneries could be built more cheaply without can shops.

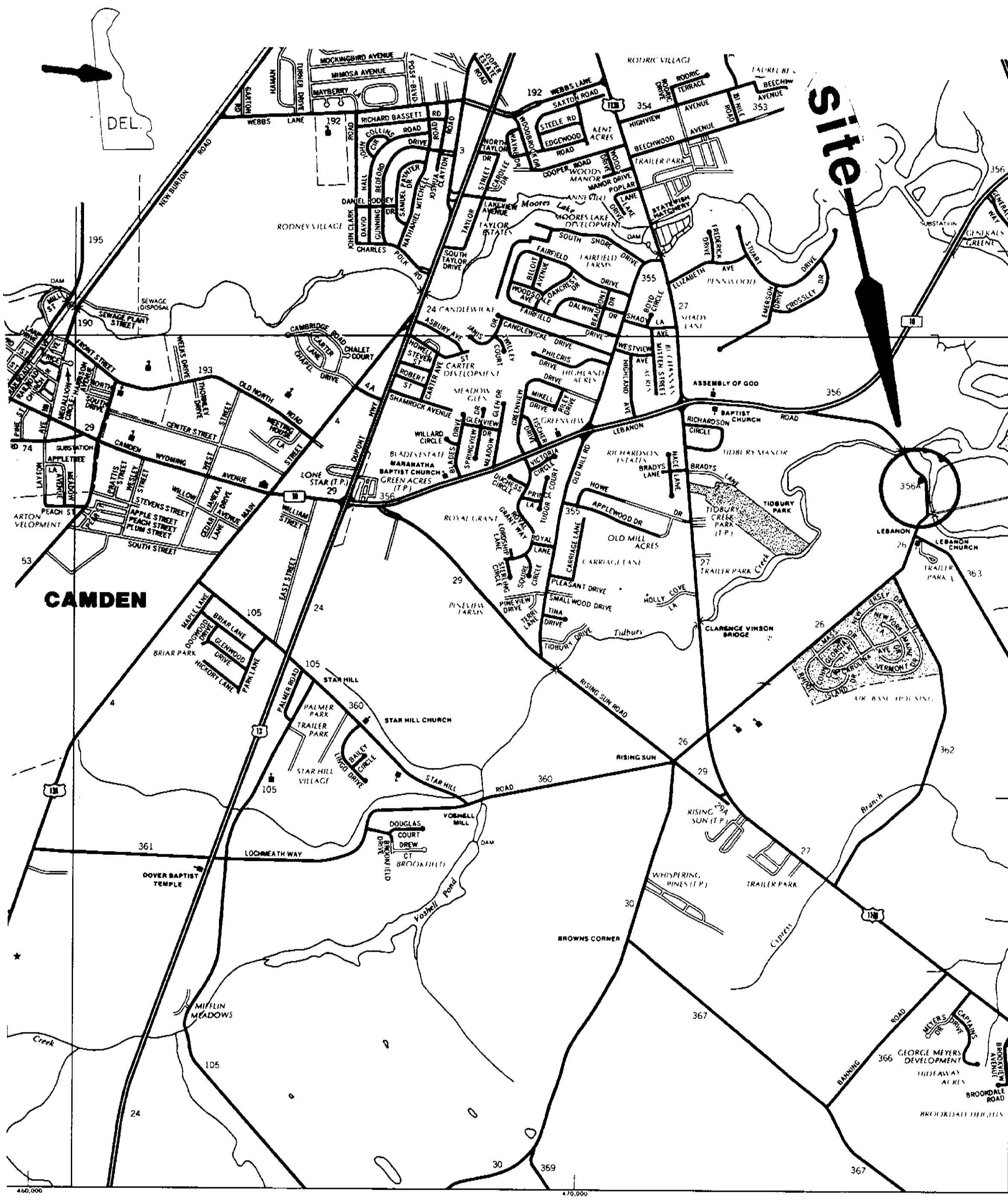


Figure 1

Location Map

Detail of Delaware Department of Transportation Atlas Map 20, 1986

PLATE 2

Ærial view of the Lebanon cannery site, from the southeast, after construction of the new Road 356a. The causeway, in foreground, is now connected by a footbridge that replaced the iron swing bridge. Photo by Tim O'Brien, 1989.

These country canneries, established during the first quarter of the twentieth century, represented a second growth period in Delmarva canning, which ended with hard economic times, the introduction of frozen food technology, industry consolidation, and stricter government regulation. The canner's economic niche is now filled by freezer plants or a combination of freezing and canning.

Today's canning plants run year-round, sometimes bringing frozen product from great distances to keep the lines running. They often are managed by people with advanced degrees in engineering and food

sciences. The modern cannery may provide housing for seasonal field or production workers, but today's workers come from different backgrounds and require different accommodations.

The Collins, Geddes cannery site at Lebanon provides a laboratory in which to study the changes in canneries over the past century. It was not unique, even though it once was called the biggest in the world. A much more elegant cannery building of the same era, Richardson and Robbins, survives in nearby Dover, but it has been gutted and converted into offices for state agencies. Nearly every Delaware town had a cannery as recently as the third decade of the present century; several are still standing, a few still in use.

What sets the Lebanon cannery apart archæologically is the fact that it operated for a short time and then closed, the site being left vacant and relatively undisturbed for a century. Most of the other canneries remained in business and gradually changed to meet new conditions, or were rebuilt as technology changed. The Lebanon cannery, on the other hand, is an undisturbed site from a very short time period, with informational value of a "sealed context" in conventional archæological terminology. Even after part of the cannery was destroyed by the present project, a significant fraction of the original cannery site remains undisturbed.

Purpose and Location of the Project

Road 356a is a small secondary route, connecting the hamlet of Lebanon with Route 10 on the west bank of St. Jones River. The road follows the river and crosses Tidbury Branch on a single lane bridge built around 1925. Dover Air Force Base is located on the east bank of the river, at the eastern end of Route 10. A few years ago, the Air Force built a housing complex at Lebanon, to serve Dover Air Force Base personnel. As a result, Road 356a received considerable commuter traffic.

The old road could not absorb the new load. Commuters were forced to wait at the one-lane bridge, or dodge the fishermen who lined the narrow causeway. The road's hairpin curves claimed their share of vehicles, some of which ran into the river. A new bridge, with straighter and wider approaches, was designed and has now been built.

In response to Section 106 of the Historic Preservation Act of 1966 as amended, the Division of Highways engaged the firm of Heite Consulting to conduct Phase I and Phase II surveys during 1988; the report of these studies was published as number 70 in the present series. Based upon that report, the State Historic Preservation Officer determined that the cannery site is eligible for listing in the National Register of Historic Places. The Phase III data recovery undertaking reported here was conducted in response to recommendations included in that report.

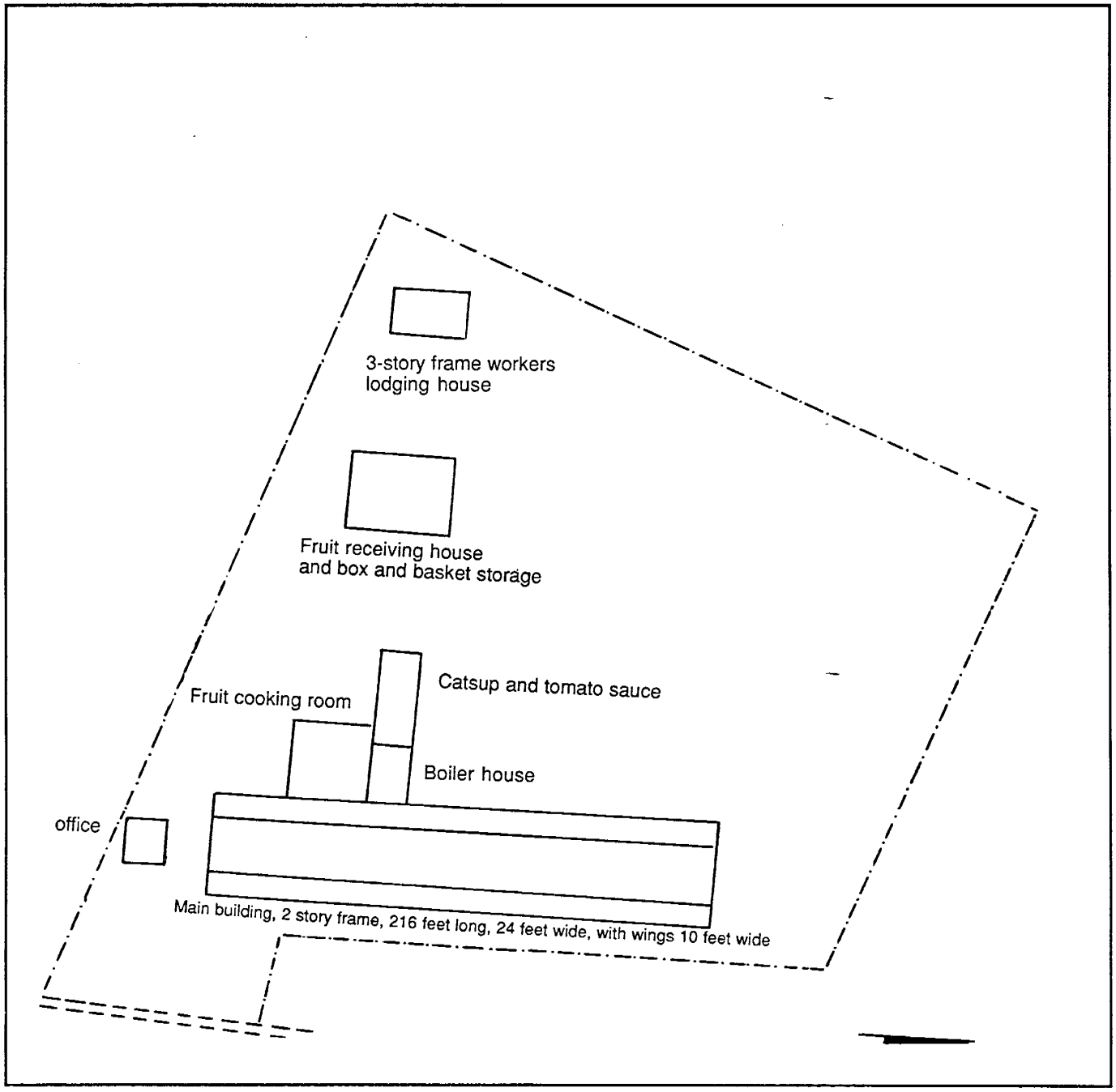


Figure 2

Reconstructed ground plan of the 1874 form of the John S. Collins and Company cannery, derived from Kent County Mutual insurance declarations by Dr. E. D. Bryan of Dover. No actual ground plan is known to exist.

Historical Synopsis

The Collins, Geddes cannery was finished and operational in 1870, and soon began to expand. The two-story main building grew from 80 feet long to 216 feet before it was destroyed by fire in December 1874. The property, by then solely owned by John S. Collins, was rebuilt on a smaller scale. The sheriff sold the plant in 1878 to a New York grocer associated with the large Thurber organization, William Paschall, who in turn sold it to an oilman from Wisconsin, William Eastman Cotter of Philadelphia.

Cotter also bought the Little Creek Cannery in 1881 and operated it in partnership with his father-in-law, James Laws Heverin. There is reason to believe that the machinery was removed to Little Creek after the 1882 season. The Lebanon plantburned again in 1884 and was never rebuilt. The Little Creek cannery burned in 1885. Rumors circulated about the insurance Cotter collected, and the cause of the fire.

Research objectives and methods

The State Plan for Historic Preservation (Ames, Callahan, Herman, and Siders 1989) defines the cannery's active period as "industrialization and early urbanization" period, 1830-1880, when "industry played a major role in changing the Piedmont Zone landscape" and "the Upper Peninsula Zone was redefined as the Wilmington backcountry." These statements are misleading, since they do not take into consideration the historical facts relating to Kent County. Planning implications are discussed in chapter 9, below.

Canning, second largest manufacturing industry in the state after shipbuilding, played a major role in changing the landscape of the Upper Peninsula Zone, of which North Murderkill Hundred is a part. During the period, this zone remained in the economic and social hinterland of Philadelphia, as it had been for two centuries. The period of Wilmington's commercial dominance did not begin until after the duPont Highway was build in the years following 1916. Canning in Delaware can be understood only in terms of the world markets it reached through the region's direct intercourse via Philadelphia and Baltimore.

Phase I investigations indicated that the bridge project probably would destroy part of the site of the original cannery building, but that most of the complex would be spared. A map compiled by Dr. E. D. Bryan of Dover (FIGURE 2) from insurance declarations projected that the north end of the first main cannery building stood on this location.

A Dover Catsup Recipe, 1883:

Makes a half gallon

(from the Cowgill Cook Book, reprinted by the Delaware State Museum)

one gallon skinned tomatoes
four tablespoonfuls of salt
four tablespoonfuls of black pepper
half spoonful of allspice
eight pods of red pepper
eight tablespoonfuls of mustard
one pint of sharp vinegar

Simmer the ingredients three or four hours, then strain through a wire sieve, and bottle closely. A little olive oil on top of the catsup will keep it from moulding.

Modern Catsup Recipe:

Makes 2 pints

(*Better Homes and Gardens* Canning and Freezing Vegetables "Complete Tear-Out Guide" n.d.)

1 1/2 teaspoons whole cloves
1 1/2 inches stick cinnamon, broken
1 teaspoon celery seed
1 cup white vinegar
8 pounds (25) medium tomatoes
1 medium onion, chopped
1/4 teaspoon cayenne
1 cup sugar
4 teaspoons salt

In small saucepan, combine cloves, cinnamon, celery seed, and vinegar. Cover; bring to boiling. Remove from heat; let stand. Wash, remove stem ends, and quarter tomatoes into large kettle. Add onion and cayenne. Bring to boiling; cook 15 minutes, stirring ocasionally. Drain off excess liquid. Put tomatoes through food mill or coarse sieve. Add sugar to juice; bring to boiling. Simmer briskly 1 1/2 to two hours or till reduced by half (measure depth with ruler at start and end). Strain spiced mixture into tomato mixture; discard spices. Add salt. Simmer about 30 minutes or to desired consistency, stirring often. Ladle into hot pint jars, leaving 1/2 inch headspace. Adjust lids. Process in boiling water bath 5 minutes (start counting time when water returns to boiling). Makes 2 pints.

Plate 3

Engraving of the canning plant of the Farmer's Fruit Preserving Company at Rising Sun, "near Lebanon, Del.," owned by local farmers. The builder, Jacob Brown, was the managing partner of the Lebanon cannery. Partners in this Rising Sun company operated the Lebanon steamboat service.

Among the remains on the site were many fragments of tinplate waste, some of it still shiny. It was demonstrated during the original survey that the can waste could provide significant insights into the manufacture of tin cans. The first objective of the present project was to document any elements of the site that might be destroyed by construction. A second objective was to recover a larger sample of can-making waste. Finally, this report is intended to provide a theoretical, technological, and historical background for future cannery investigations in Delaware, which inevitably will be necessary.

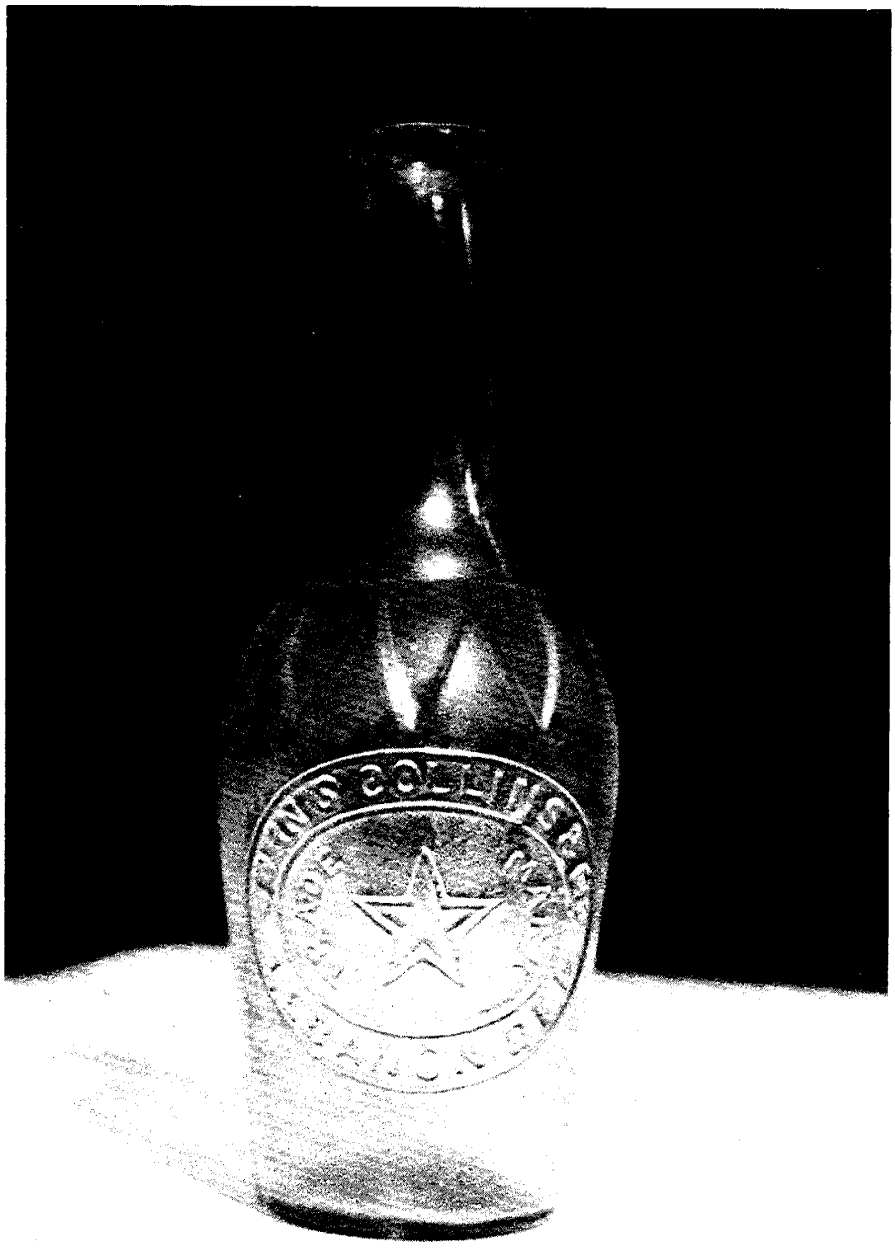


Plate 4

Catsup bottle from the Lebanon company, exhibiting the name of the firm as it existed between 1872 and 1874. The traditional bottle style is little changed today, but the recipe has changed. These bottles probably were made in New Jersey and shipped across the bay in a schooner to Lebanon wharf. Loaned by Dr. E. D. Bryan.

Archæological literature of Delaware canneries is sparse. Dr. E. D. Bryan has amassed considerable primary data on the subject, which he has interpreted for museum purposes and deposited with the Delaware State Museum. One other Delaware cannery site was archæologically reported simultaneously with the first part of this project (Coleman, Hoseth, Custer and Jaggers 1988). Dr. Bryan's comprehensive list of Delaware canneries is reproduced as an appendix to this report, and his illustrations have been used throughout.

A number of constraints were taken into account when designing the project. The entire site had been cultivated after the cannery was removed, destroying any contexts that might have existed in the top foot of soil. On the south, a septic tank serving the duplex apartment house was situated in the middle of a proposed cut. The north part of the cannery site, which was to suffer the greatest damage, was covered by second-growth trees and recent trash accumulated since the field was abandoned about thirty years ago.

Since most of the anticipated remains were shallow foundations surviving in the few inches of subsoil just below plow depth, it was deemed imprudent to knock down the trees with a machine in preparation for archæology. The strategy chosen was designed to capture the architectural data by using machines for the heavy digging, but avoid uprooting the stumps. The site was dug in patches, to avoid jerking out the roots and destroying the shallow footings entwined in them. A rubber-tired front loader would visit the site, clear the plowsoil from an area, and leave it for archæological recordation. Given the uncertainty of winter weather and difficulties in scheduling machine time for short jobs, such a piecemeal approach is normally an excessively expensive and time-consuming way to dig a site. But it was possible in this instance because of unusual logistical circumstances. Both the investigator's home and the backhoe's headquarters were very near the site. The result was a more leisurely examination of features than normally is possible on a salvage excavation.

The excavation register from the 1988 Phase I-II survey was continued (APPENDIX 1); the catalogue and interpretation in this volume treats both seasons' work as a single investigation, even though figure numbers in the present volume are restarted and some material from the earlier volume is repeated here.

CHAPTER 2

TECHNOLOGICAL AND INDUSTRIAL BACKGROUND HISTORY

THE FIRST CANNERS IN KENT COUNTY were tinsmiths by trade; indeed, both Stetson and Ellison of Camden, and Richardson and Robbins of Dover practiced both canning and architectural metalwork. Names of can inventors like Borden, Underwood, and Van Camp survive today as names of food processing companies. After the tinsmiths had developed the technology, entrepreneurs from other backgrounds entered the trade. These second-level entrepreneurs employed a simplified technology that followed the "American System" in which parts of the manufacturing process were assigned to relatively unskilled workmen who did not possess the full range of skills known to a professional tinsmith. Each workman's output was so standardized that each part would, in theory, always fit the part made by another workman. Lebanon's canners fell into the latter category. Their relatively untrained workmen made only parts of cans and assembled them according to prescribed procedures, whereas the tinsmith-canners made other tin products and could be expected to innovate more readily

Early cans were more complex than today's. The cans were manufactured with a hole in the top, through which the product was inserted. A small cap was then soldered over the fill hole. The product was then cooked, while gases escaped through a pinhole opening in the cap that was soldered shut while the contents were still hot.

Evolution of the market for canned food

Before the Civil War canned goods were luxury items. Provisions for British Arctic expeditions were packed under contract, sometimes with fatal results. Lead from sloppy solder joints leached into the food and caused the Franklin expedition's tragic loss. Other cases of lead poisoning retarded the product's introduction and drove technological changes that eventually resulted in a can with no solder whatever exposed to the can's contents.

Lead poisoning and off-taste caused by contact with metal were among the factors that prompted public resistence to certain hermetically canned foods. Dry merchandise, which could be canned without heat and solder, was more readily accepted. Tobacco, oils, gunpowder, and coffee, were commonly sold in tins without major public resistence.

Throughout the nineteenth century, food canners tried to improve their product and their production methods, but most cans continued to be made individually by workers in the loft over the canning factory. Americans patented many different processes and machines, which may be used as dating evidence on sites where cans have survived. Some of the innovators founded canneries that produced their peculiar cans; Richardson and Robbins' famous tapered plum pudding can was made in Dover within living memory. By 1902, modern open-top cans had replaced many of the hole-in-top styles; these cans are made by machine in separate manufacturing plants. As the can manufacture and canning industries separated, unlabelled food containers became standardized and potentially less sensitive to archæological analysis.

Early history of canning in America

Tinware manufacture began in America around the time of the Revolution (Fontana and Greenleaf 1962). Tin-plated steel sheets had long been used for utensils in Europe, perhaps as early as the thirteenth century.

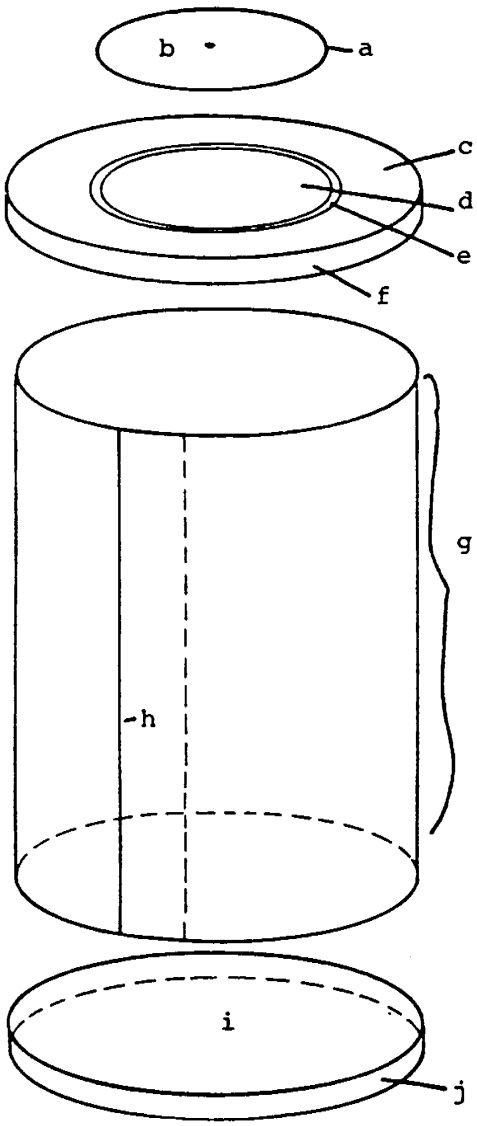
Plate 5

Cans produced at the Lebanon cannery, from the collection of Dr. E. D. Bryan

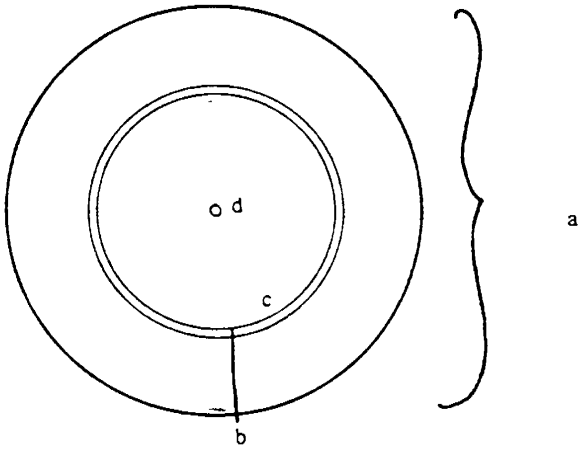
Figure 3

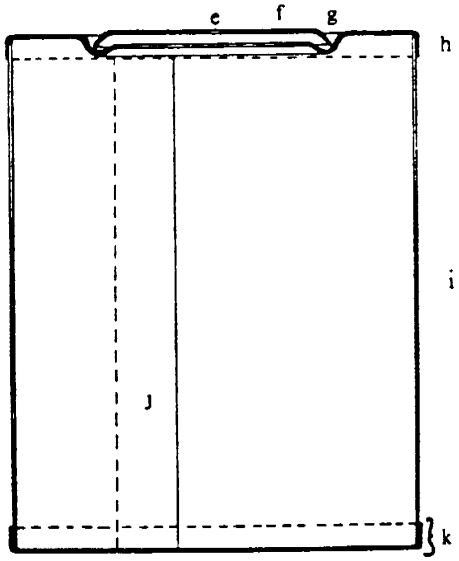
Anatomy of a nineteenth-century can

Based upon a drawing by J. Métivier in Parks Canada Manuscript Report 299, *Manufacturing typology for tin containers from the Arctic Salvage Project*, by Barbara J. Wade, 1978.



Left:
a. cap
b. air vent
c. top end
d. filler hole
e. channel
f. flange
g. can body
h. lapped side seam
i. bottom end
j. flange





Right:
a. end
b. channel
c. cap
d. air vent
e. air vent
f. filler hole cap
g. solder
h. end
i. body
j. lapped seam
k. bottom end

Plate 6

Interior of the Richardson and Robbins plant in Dover, early twentieth century, from a glass plate negative in the Holmes Studio collection, copied through the courtesy of Mr. and Mrs. Howad Sheppard.

In 1795, the French government offered a reward of 12,000 francs for a method of food preservation to support Napoleon's armies. A French confectioner, Nicholas Appert, won the prize in 1809 for a method using corked bottles and gained himself the somewhat misleading title of "father of canning." He published a treatise in 1810, describing the process, which involved heating the bottled provisions in a water bath, with emphasis on excluding air (Minchinton 1957:254). A similar process had been advocated by an Englishman named Saddington in 1807 (Sim 1951:12-14). Tinned cans for food packaging were patented in 1810 by Peter Durand in England and marketed under the relatively unappetizing name of "embalmed provisions." He introduced a handmade can to America in 1818.

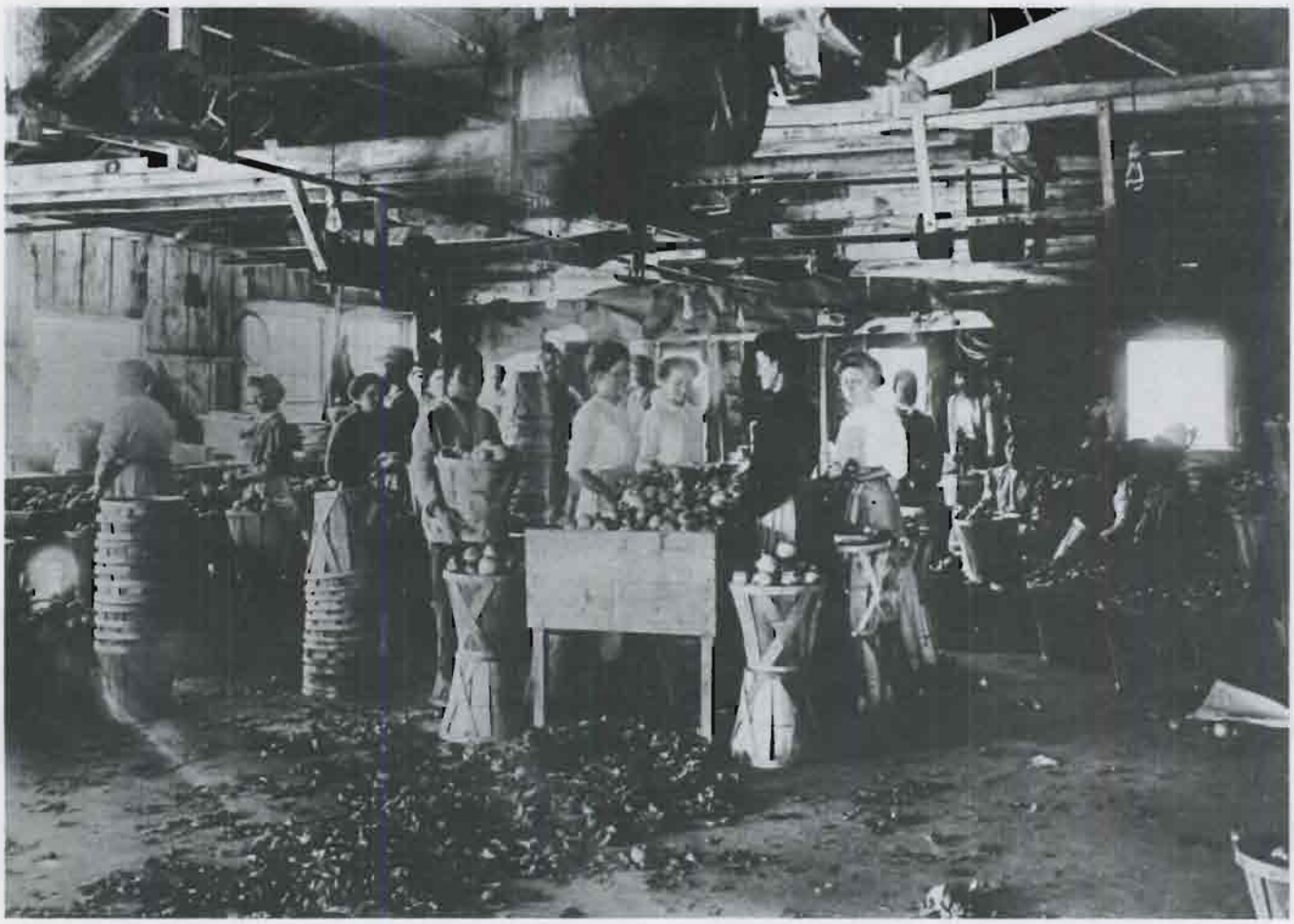


Plate 7

Work room of the Samuel Derby apple packing house at Woodside early in the twentieth century. Fresh shipment of fruits was facilitated by the advent of the railroads, but markets were limited by the keeping qualities of the fruits. Photo courtesy of Samuel D. Walker.

Durand's cans were made by hand, by tinkers who could produce as many as sixty a day, making each one individually. Each can had a hole in the top, into which the product was placed; after the can was filled, a cap was soldered over the hole. This would become the standard food can through the rest of the nineteenth century.

The last necessary step that made possible modern canning was the process of "exhausting," introduced by Pierre Antoine Angilbert in 1823. Each soldered-on cap had a small pinhole, which was left open while the can's contents were cooked; the pinhole allowed the escape of gasses during the capping process, and during the cooking. While the can was still hot, a drop of solder was placed on the hole; the

cooling can then contracted and a vacuum formed inside (Sim 1951:15). The vacuum was thought to inhibit spoilage in those days before bacterial contamination was fully understood. Louis Pasteur in 1860 demonstrated that the effectiveness of this technology was due to the fact that it killed bacteria and kept new ones from invading the product.

William Underwood, an English pickler, arrived in Boston in 1819 and began packing fruits in glass. By 1842, his company went over to tin cans, in which Underwood became an innovator and eventually an industry leader.

Regional dominance of the national industry

New Jersey's Delaware Bay coast was a major center for the manufacture of can-making machinery during the second half of the nineteenth century. Since the sizes of end dies dictated the sizes of cans, it is not surprising that a "New Jersey" size (TABLE 1) became a national standard. Can manufacturers in Baltimore, supported by a canning machine industry there, supplied cans and parts of cans throughout the Chesapeake region. Delaware, lying between the two principal centers of supply and innovation, profited technologically. A number of the canning companies listed in the appendix were owned by Baltimore, Aberdeen, and Havre de Grace firms, some of which were among the more innovative canners in the industry.

Hugh S. Orem, a Baltimore canner, in 1914 proclaimed that "...from the very beginning, Baltimore became the centre of the industry, and holds the supremacy to this day. All other cities and towns in the United States wherein canning is conducted radiate from it much like the spokes in a wheel radiate from its centre or hub." According to Orem, it was the canned oyster that gave Baltimore its advantage, but fruits and vegetables generated more revenue in the long run (Judge 1914:8-11).

Mechanization of the can-making process began in earnest when Allen Taylor in 1847 invented the foot-powered press, which could form and cut the tops and bottoms in one operation (Sim 1951:22). Thereafter, every cannery needed a press and dies, which became the mainstay of the cannery equipment industry for another half century. William Numsen and Sons of Baltimore introduced the combination die, which could stamp a top and punch the filler hole in one operation, thus simplifying the operation. Combination dies eliminated one step in the process, but required bigger outlays for heavier end-stamping presses. The presence of combination dies in a plant therefore reflects a manager's choice between labor-intensive and capital-intensive processes.

TABLE 1

CAN SIZE STANDARDS, 1883, 1922, AND TODAY

[DIMENSIONS ARE EXPRESSED IN INCHES AND CAPACITIES IN OUNCES.]

NOMINAL SIZE	HOLE IN CAP 1883 DIAMETER	1883 HEIGHT	SANITARY 1922 DIAMETER	1922 HEIGHT	SANITARY 1988 DIAMETER	1988 HEIGHT	1988 VOLUME
#1	2 3/4	4	2 11/16	4	2 11/16	4	10
#2	3 7/16	4 9/16	3 7/16	4 9/16	3 7/16	4 9/16	19
#2 1/2	4	4 3/4	4 1/16	4 11/16	4 1/16	4 11/16	28
#3, 4 7/8 inch			4 3/16	4 7/8			
#3, 5 inch or New Jersey	4 1/4	5	4 1/4	5			
#3, 5 1/2 inch			4 1/4	5 1/2			
#3	4 3/16	4 7/8			4 1/4	4 7/8	32
#6	always double #3				Uncommon today		would be 64
#10 [gallon]	6 1/4	7	6 3/16	7	6 3/16	7	105
[modern gallon]					6 3/16	8	128

HOLE SIZE STANDARD DIAMETERS IN 1883:

Small Hole..... 1 1/2
Medium Hole..... 1 3/4
Peach Hole 2 1/16
Pineapple Hole..... 2 7/16
Extra Pineapple Hole..... 3 1/2

Standard 1883 dimensions were provided by Dr. E. D. Bryan, Dover. Modern dimensions were provided by the Division of Weights and Measures, Delaware Department of Agriculture, Camden. Volumes are expressed in fluid ounces. The 1922 sizes are for sanitary cans, as listed in the *Canning Trade Almanac* and quoted by Jim Rock, 1987, page 98.

Two leading producers of can-making machinery were the Ferracute company of Bridgeton, New Jersey, and the Ayars Machine Company of Salem, New Jersey, both port towns easily available to canners on both sides of the bay. The Ferracute foot press, first built in 1865, became the industry standard, of which 112 had been built by 1877 (Sim 1951:70). E. L. Jones, whose foundry and machine shop manufactured can-making machinery at Dover, Delaware, had been trained at Ferracute.

The era of the Lebanon cannery was a period of extremely fast growth and technological change for the American canning industry. American production of canned vegetables increased from 4 million cases in 1870 to twenty million in 1889. In 1870 there were less than a hundred American canneries; by 1900 there were eighteen times as many (Minchinton 1957:258). American dependence upon the British tinplate manufacturers ended as our own industries began to meet demand toward the end of the century. By 1897 there were 180 tinplating mills in the U.S. and eleven under construction (Minchinton 1957:67).

Cooking time, a costly matter, had been reduced from five hours to thirty minutes around 1860 when it was discovered that calcium chloride would raise the boiling point of the water bath. Pressure cookers, called Shriver kettles, introduced in 1874, further reduced the cooking time (Alberts 1973:48). This steam process so shortened the cooking time that canners' capacity leaped startlingly.

From craft to industry

After tinsmiths had developed the technology, entrepreneurs from other backgrounds entered the trade. These second-stage entrepreneurs employed a simplified technology that followed the example of the "American System." Lebanon's canners fell into the latter category. The relatively untrained Lebanon workmen made only cans, according to prescribed procedures, whereas the tinsmith-canners made other tin products and could be expected to innovate more readily. Can manufacture became an unskilled trade, conducted under unskilled supervision; cans served the purpose, but craftsmanship was absent. Under emerging philosophies of the American industrial system, a product was considered entirely satisfactory if it was merely adequate to meet technical requirements.

The 1876 Delaware Directory listed three "tinsmiths" and seven "tin can makers" at Lebanon. All apparently were employed by the cannery, at different levels of skill.

Early cans were more complex than today's, and required more manufacturing steps. The cans were manufactured with a hole in the top, through which the product was inserted. A small cap was then soldered over the fill hole. The product was then cooked, while gases exhausted through a pinhole

opening in the cap that was soldered shut while the contents were still hot. As the can cooled, a vacuum formed; a reassuring hiss upon openingwas regarded as the sign of safe canned goods, as it is today.

Individual parts of the process were mechanized at different times. By 1880, it is estimated that a mechanized can shop with two operators could produce 1500 cans a day (Alberts 1973:49). This speed did not favorably impress the hand can makers, who feared for their jobs. The Cox capping machine and the "Joker" machine for soldering ends onto cans caused labor unrest during the seventies and eighties, as entrenched canmakers began to see even more massive de-skilling on the horizon. Baltimore can companies are said to have equipped large rooms with ranks of unused soldering machines, for the sole purpose of intimidating the can shop personnel, who knew that the new machines could make five times as many cans as a man working alone. About 1885 the number of machines in service began to increase and the can making workforce shrank (Judge 1914:56).

Changing workforces in the cannery

The system of breaking skilled work into unskilled components, and of simplification for the sake of production, is mechanization, the basis for the American System of Manufacture. The next step, a generation later, would be automation, in which the workman and hand methods were replaced by machines and individual sheets by huge rolls of tin. Individual steps in a mechanized process can be performed by hand craftsmen, but there is no turning back from automation, since it changes the entire process.

During the process of incremental mechanization, it was possible for hand workers to resist change as each element was mechanized. The labor history of canning, like the history of many industries, is full of small labor-saving steps, each of which was resisted by workmen who became increasingly militant as they watched their skilled trades being replaced by mindless machines. This militance in turn inspired management to seek new automation technologies that would eliminate the workers altogether.

Even though soldered cans were made individually, they were filled on an assembly line, in which the cans passed from one worker to another. To serve the constantly improving can-filling and can-sealing machinery, inventors introduced machines for peeling fruit and shelling peas. Canning machinery became standardized, conforming to standard dies provided by the stamping-machine makers. By 1883, today's can sizes had been largely established (TABLE 1). Interchangeability was forced by standardization of machinery and by the availailability of parts; caps for fill holes, for example, were available from suppliers.

TABLE 2

OUTFIT OF TOOLS FOR CAN-MAKING

Ferracute Machine Company catalogues in the 1880s included a standard shop package "for the convenience of those about starting in the canning business." The capacity of this shop was estimated at about 3,000 cans a day, running with 4 or 5 men.

1	1 Foot Press 243 for Combination Dies	$80
2	1 Pendulum Press 213 for Cap Dies	40
3	1 No. 20 Square Shears	40
4	1 No. 2 Forming Rolls	9
5	1 Pr. 1 lb. Comb. Top Dies, for tops and bottoms	33
6	1 Pr. 2 lb " " " " "	35
7	1 Pr. 3 lb " " " " "	38
8	1 Pr. No. 1 Cap Dies, to fit top made in item 5	13
9	1 Pr. No 2 " " " " " " 6	13.50
10	1 Pr. No 3 " " " " " " 7	14
11	1 Rotary Solder Cutter	15
12	3 3-lb Seamer Frames with Cylinders	15
13	3 1-lb extra Seamer Cylinders	5.25
14	2 2-lb " " "	6
15	3 Can-Makers' Fire Pots	12
16	3 Floating Boards	6.75
17	3 Sets Soldering Coppers, 15 assorted	21
18	3 Sets Rosin and Wiper Boxes	1.50
19	1 Set Bench Tools — Hand Shears, Files, Vise, Hammers, Monkey Wrench, &c	11.50
20	1 Lot Crating, Boxing and Carting, at cost	7.50
21	1 Lot Bolts, Wrench, extra Crews, Springs, etc., no charge	
	Total	$417

Finally, in 1898, the Max Ams company introduced the modern open-top can, which could be made, filled and sealed entirely by machinery. When automation finally came, it was irreversible. The entire factory, with all its individual steps, was replaced by a single complex of machinery, which made better cans by new methods that hand craftsmen could never reproduce. The new cans were called "sanitary," because the product was not touched by the metal and they did not contain solder joints that might transfer lead to the product..

Tomato canning machinery

Tomatoes were not among the first foods to be canned, but they soon became the most important. Because they are acidic, tomatoes and fruits can be safely processed by less exacting and expensive methods. The older, low-heat, "water bath" method is still recommended only for the home canning of tomatoes. Modern cookbooks caution that "all meats and vegetables except tomatoes must be processed by the pressure canning method." (National Presto Industries 1974:39)

The modern tomato as a food is largely the product of the canning industry. Cookbooks published before the middle of the nineteenth century ignore it; most people thought it was inedible. In Salem, New Jersey and in Lynchburg, Virginia, there are legends of prominent citizens who publicly ate tomatoes to prove that they were not poisonous.

The first commercial canning batch of tomatoes is supposed to have been processed by Harrison Woodhull Crosby of New Jersey in 1847. In the same year, the first regular cannery in America, at Phalanx in Monmouth County, New Jersey, was established. The fruit proved to be extremely amenable to the canning process. As the industry developed, tomato canning outstripped other products in the Delmarva region and in a belt across the country between 36° and 40° north latitude. Because it was such a forgiving product, the tomato could be canned in "low-tech" factories without pressure cookers. As late as 1914 some country canners still were using wood-fired water bath cookers and soldered cans (Judge 1914:82-85).

The first stage in canning a tomato is scalding. Sometimes the tomatoes were put in hand baskets, in which they were sloshed around in boiling water. Later they were dumped in large wooden tubs full of hot water.

Then the fruits were peeled by hand and put in buckets, from which they were inserted through the fill holes into the cans. The top of the can was wiped clean and the cap was soldered in place by the "capper," a most influential employee who could make as much as $14 a day. It took dozens of women to fill the cans without breaking the tomatoes, and about half as many men to solder the caps in place.

TABLE 3

EQUIPMENT OF A DELAWARE CANNERY, 1881

The cannery at Drawbridge, Sussex County, was a two-story frame building, 30 feet square. An advertisement appeared in the *Breakwater Light* of Lewes on March 26, 1881, listing the following cannery equipment for sale.

1 15-horsepower boiler
1 small engine
8 copper kettles
3 large cedar tanks
15 bath racks
1 number 2 press
1 pair number 2 square shears
1 solder kettle
1 solder mold
1 can forming machine
1 lot top and bottom dies, cap dies, etc.
soldering block
fire pots
grater
wrenches
punches
tongs
ladles
anvils
vices and other equipment

During the decade immediately after the Lebanon cannery closed, several inventors in rapid succession introduced capping machines that put the cap in place and soldered it down without the services of the capper. Other machines wiped the tops.

Filling machines, some of which were foot powered at first, eliminated the slow job of measuring and hand packing the tomatoes. The last of these machines resembled carousels, for the cans were stacked on conveyors, which passed them into a rotary track under the machine.

Many of the carousels in the region were made by the Ayars Machine Company of Salem, New Jersey, which proudly celebrated its centennial in 1937 with a new pea filler, the first of which was bought by H. P. Cannon and Sons of Bridgeville, Delaware. Ayars closed in 1951, during the decline of the

canning industry after World War II The intimate connection between Delaware canners and New Jersey suppliers reached back to the beginning of canning.

Capping machines, introduced after 1885, eliminated the trade of cappers, and could be run by relatively unskilled personnel. The only skilled person in the plant thereafter was the man who touched up the machine soldering jobs, and soon he, too, would be eliminated. Cappers resisted, but to no avail. Other machines, such as peach peelers and pea viners, eliminated some of the more labor-intensive parts of the job and reduced the size of the workforce.

The sanitary can revolution changed the face of tomato canning. It was now possible to put the fruits into the cans without damaging them, since the entire top of the can was open. The number of employees was reduced, and canneries took on a neater appearance. In 1914, capper inventor John D. Cox described in raptured terms the changes that had taken place in the industry:

> ... In the early years we have shown that great hordes of workmen and workwomen were necessary in the canning of tomatoes, and because of the crude methods of procedure the entire operation took on an unsightly appearance that gave rise to the harmful stories that the tomato cannery was a dirty place, and its workers even worse. The packers themselves added much to this through careless methods and failure to regard sanitary conditions. All this has been changed. Improved machinery has reduced the number of hands necessary, eliminated the tracking of tomato waste and slop around the factory by confining it to the proper drains and conveyors; floors are of concrete, walls white and spotless, many factories have their workers in uniforms and caps, and the fresh tomatoes from the fields are washed, sorted and cleansed as not even the careful housewife could do; filled into the cans and handled by these ever ready, strictly clean, steel fingered servants, processed and even labelled by machines that have long been the wonder of all, and go to the consumer a splendid article, improved in quality and purity, clean as it is possible to produce any food.
>
> (Judge 1914:85)

Canning is an inherently dirty business. The Pure Food law of 1906 prompted changes and plant closings, but much of the product never went into cans. The New Jersey Department of Health in 1910 estimated that only half the tonnage of tomatoes actually went into cans. A few years later Delaware named a cannery inspector to ensure some measure of cleanliness. Spillage was estimated at 5.5% (Sim 1951:35). Pulp by-products and peels could be fed to livestock, but operating canneries had a characteristic aroma that was unmistakable. John S. Collins of the Lebanon cannery successfully experimented with drying apple and peach peels and apple cores to make jelly.

The Sanitary Can and the end of canmaking shops

In 1914, an official of the American Can Company bragged that "In America can-making has risen from a craft to an art." (Cobb 1914) It would be more accurate to say that the can had fallen from a craft to a manufacturing technology. He was boasting that in America his company was supplying cans from factories located in canning districts, while Europeans continued to make them at the canneries in the traditional way.

Soldered cans had several disadvantages, especially for the canning of fruits. Sometimes the product would be damaged when operators tried to squeeze pieces of fruit through the fill hole. The intense heat of the capper's soldering iron would caramelize the sugar in the syrup, leaving harmless but unattractive little black spots. Worst of all, canned foods tended to acquire taste from the metal of the can, and no interior coating could be devised that would not be burned away by the soldering process.

Sanitary cans are characterized by crimped, rather than soldered, closure seams. They are "sanitary" in the sense that the user is protected from lead in the solder, and from metal contamination by interior enamels that were impossible in soldered cans. The side seams were double crimped and soldered externally with a very small amount of wire solder precisely positioned. Systems of "double" seaming had been used in containers for dry goods, such as gunpowder and spices, but during most of the ninteenth century they were considered inadequate for hermetically sealed foods. Decorative metal boxes and cans, formed of printed metal sheets, had been used for dry goods, but wet canned goods were labelled either with paper labels or were painted and stencilled.

By the last decade of the century, progress in streamlining the manufacture of soldered cans had slowed; if production were to increase, it would require some radical departure from the old methods. Some European countries at that time were forbidding the use of soldered cans, thus encouraging rival packing technologies. The Max Ams Company of New York exported canned meat products to Europe, where soldered cans were meeting stiff resistence. The solderless alternative, lock seams, were extremely

crude, although they were being made laboriously by hand in Europe. In 1888, Ams experimented with lock seams, for which he perfected a machine in 1898 (Rock 1987).

European double-seamed cans of the period were sealed with a thick rubber gasket, over which the can lid was crimped. American manufacturers replaced this gasket with an adhesive compound and a series of innovations followed in rapid succession. In 1901, the Max Ams Machine Company demonstrated the first practical system of machinery for making and sealing sanitary cans in quantities.

Plate 8

Second location of the E. L. Jones machine shop and foundry in Dover, which was established with the assistance of A. B. Richardson, who wanted a nearby source of machinery and service for the Richardson and Robbins cannery. Photo courtesy Mrs. W. Ross Jones and Dr. E. D. Bryan

Also in 1901, the newly-formed American Can Company absorbed most local can-making firms, creating a tin can trust similar to monopolies dominating other industries. The American tinplate industry also was undergoing massive changes. In 1898, thirty-eight manufacturers joined into the American Tinplate Company, which joined United States Steel in 1901 (Rock 1987).

The canning revolution was under way. The Sanitary Can Company was established by the Ams interests in 1904 to make the new cans using Ams machinery in Fairport, New York. Plants in Bridgeton, New Jersey, and Indianapolis followed in 1907. It merged into the American Can Company in 1908. The new company swallowed the competition within a few years and established huge factories making cans from continuous rolls of tin plate, rather than sheets. The can-making craft was gone, except in a few backwaters. England did not build a sanitary can factory until 1930 (Rock 1987:14).

Canned milk continued to be delivered in soldered cans, as did certain meat products. A few canners held onto the filler hole for a while, but the sanitary can and its successors were firmly in the majority. Some traditional shapes persist, such as the key-opening tapered corned beef can of 1875 with the key opening top (Rock 1987:55).

Canned beer was introduced in 1935.

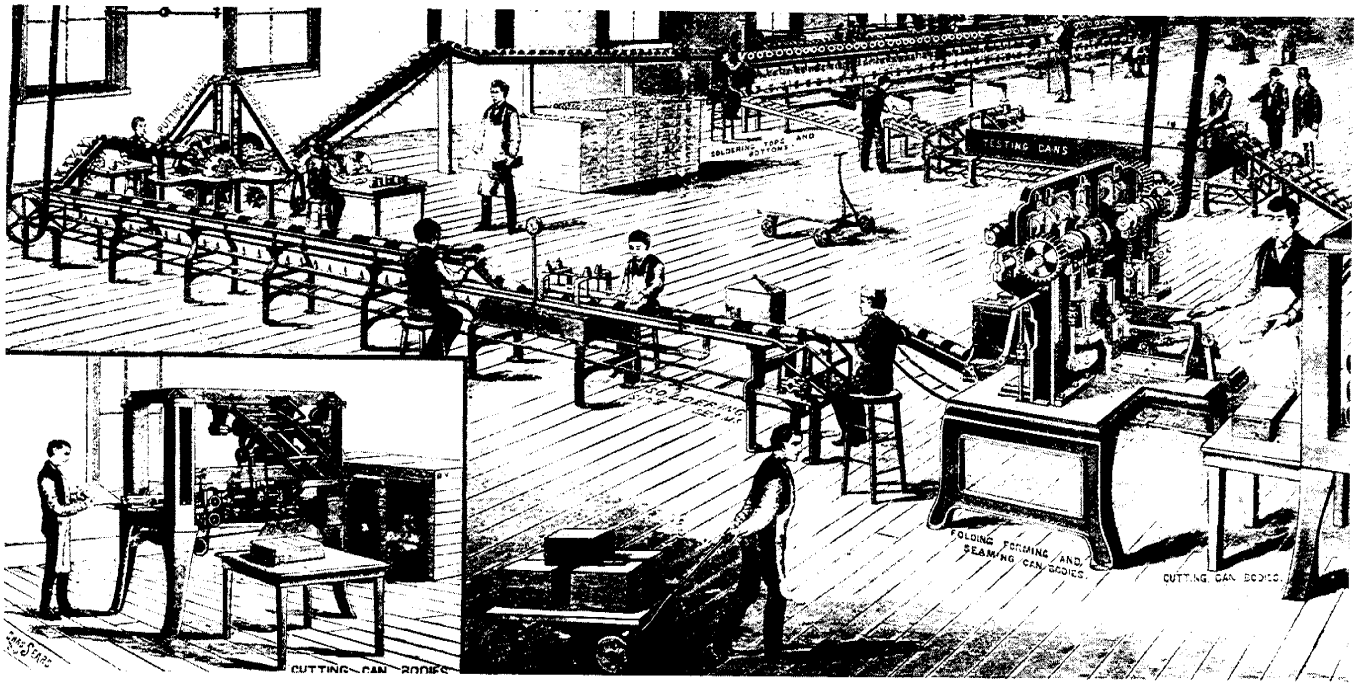


Plate 9

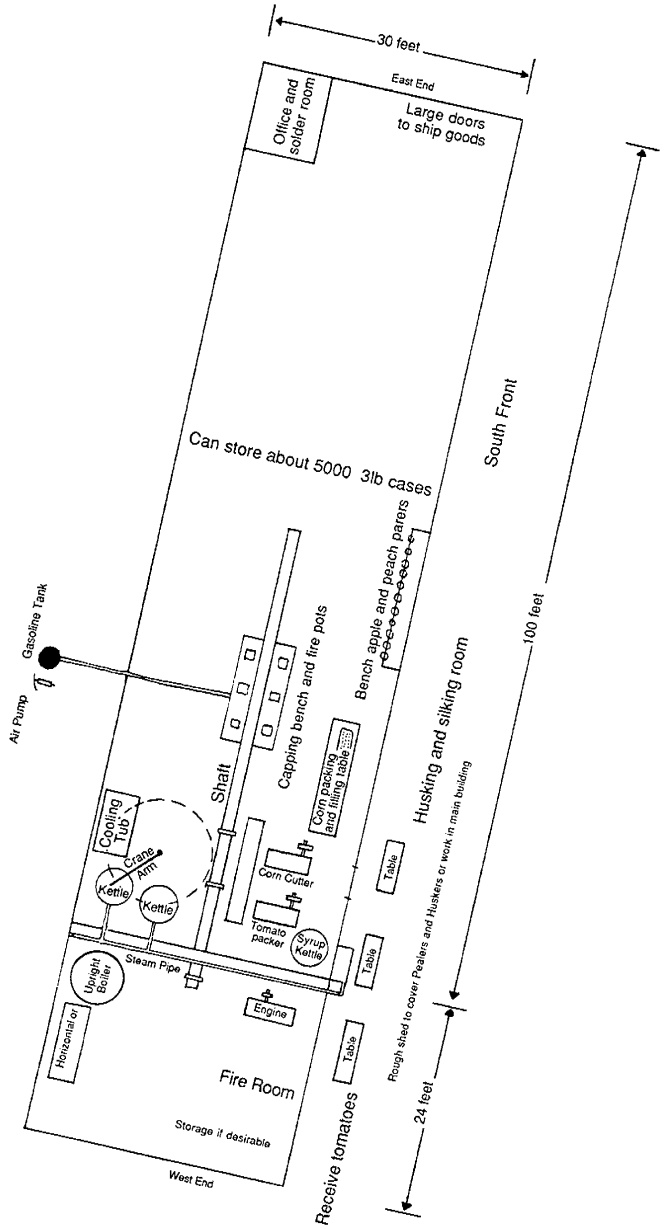
State-of-the-art can-making machinery, illustrated in *American Machinist* magazine, 1883. Cans were formed from sheets of metal 14" by 20", and all the processes duplicated manual operations.

Figure 4

Plan of a canning house

30 by 124 feet

Redrawn from a plan in the catalogue of the E. F. Kirwan Manufacturing Company, Baltimore, circa 1890. This "ideal" plant is similar in many respects to the plant at Lebanon. The drawing has been reoriented to facilitate comparison with the intepretation drawings, in chapter 6.



CHAPTER 3

CANNING IN NINETEENTH-CENTURY DELAWARE

CANNING ENJOYED A CENTRAL ROLE in Delaware's economy from the Civil War era through World War II. Every community worth the name was a cannery site, and larger towns had several (APPENDIX 4). Introduction of canning technology allowed Delaware's nineteenth-century farmers to diversify their vegetable and fruit crops, and gave them access to distant markets beyond the range of fresh vegetable sales. The history of canning, however, is also the history of changing settlement patterns.

Canning and Settlement Patterns

Settlement patterns analysis is the core of recent synoptic works in the fields of archæology and historic preservation. A theme called "Settlement Patterns and demographic change" is identified at the top of the priority lists in the State Plan for Historic Preservation (Ames, Callahan, Herman, and Siders 1989:79). Settlement patterns provide a convenient framework for the study of historic agricultural communities. Geographers are fond of defining the American rural landscape in terms of central places along major lines of communication (Conzen 1981:311).

Philadelphia's steamboats and schooners tied the Delaware and South Jersey coasts together commercially. Before the railroad came, the bay was the main artery of trade, and both personal and trading relationships continued long after the trains came. Glass containers and canning machinery from Millville, Salem, and Bridgeton could, and did, cross the bay easily to Delaware canneries. When a glassworks opened in Dover, sand and workmen came from the Millville area. This east-west connection with New Jersey dimmed somewhat with the coming of the railroads, but was not extinguished until the more recent period of highway dominance, with its strong north-south orientation.

TABLE 4

CANNERY OWNERSHIP IN DELAWARE

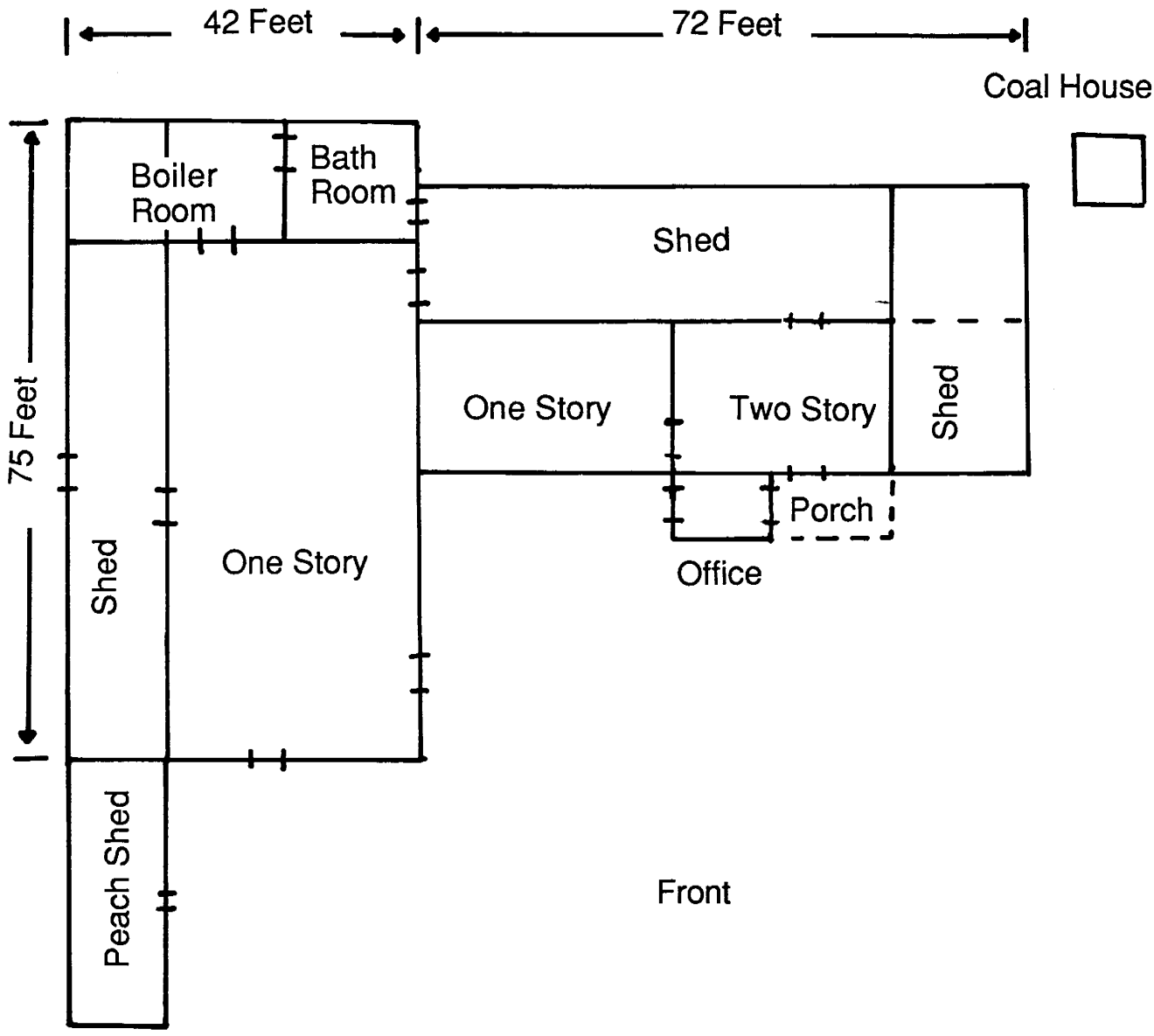
PLANT LOCATION: / LOCATION OF OWNER	SUSSEX COUNTY NO.	SUSSEX COUNTY %	KENT COUNTY NO.	KENT COUNTY %	NEW CASTLE COUNTY NO.	NEW CASTLE COUNTY %	TOTAL	PERCENT OF ALL FIRMS
Delmarva	240	80.26	207	82.47	64	62.75	511	78.37
Maryland:								
Joppa	1	0.33					1	0.15
Aberdeen	16	5.35	10	3.98	22	21.56	48	7.36
Bel Air	5	1.60					5	0.76
Baltimore	12	4.01	10	3.98	2	1.96	24	3.68
Harford Co.	1	0.33	6	2.4			7	1.07
Havre de Grace	5	1.60	1	0.39	5	4.90	11	1.68
Maryland subtotal:	*40*	*13.22*	*27*	*10.75*	*29*	*28.42*	*96*	*14.70*
Pennsylvania:								
Philadelphia	2	0.66	2	0.79	3	2.94	7	1.07
West Chester					1	0.98	1	0.15
Pennsylvania subtotal:	*2*	*0.66*	*2*	*0.79*	*4*	*3.92*	*8*	*1.22*
New Jersey:								
Trenton			1	0.39			1	0.15
Salem					1	0.98	1	0.15
Camden	2	0.66	1	0.39	1	0.98	4	0.61
Bridgeton	1	0.33					1	0.15
Burlington					1	0.98	1	0.15
New Jersey subtotal:	*3*	*1*	*2*	*0.78*	*3*	*2.94*	*8*	*1.22*
New York:								
New York City	1	0.33	4	1.59	1	0.98	6	0.92
Other cities	2	0.66					2	0.30
New York subtotal	*3*	*1*	*4*	*1.59*	*1*	*0.98*	*8*	*1.22*
Miami, Florida	4	1.33					4	0.61
Chicago, Illinois	1	0.33	2	0.79			3	0.46
Other	6	2.00	7	2.78	1	0.98	14	2.14
Total ownerships	299	100%	251	100%	102	100%	652	100%

SOURCE: Derived from Bryan's list of Delaware canneries, appendix 4. Each firm name is considered a new ownership unless it obviously was a mere name change. Local ownership includes any owner on Delmarva, as well as all the ownerships for which no place is given. These determinations are purely subjective and superficial, and should not be interpreted as definitive.

Figure 5

Plan of the Little Creek cannery

Redrawn from a plan in Kent County Mutual Insurance Company declaration 4518, dated September 2, 1873, Delaware Archives. The applicant was James L. Heverin, president of the company and father-in-law of William Eastman Cotter, who was the principal owner of both the Little Creek and Lebanon canneries. Heverin was also a director of Kent County Mutual, and had signed the application for insurance on the Lebanon cannery.



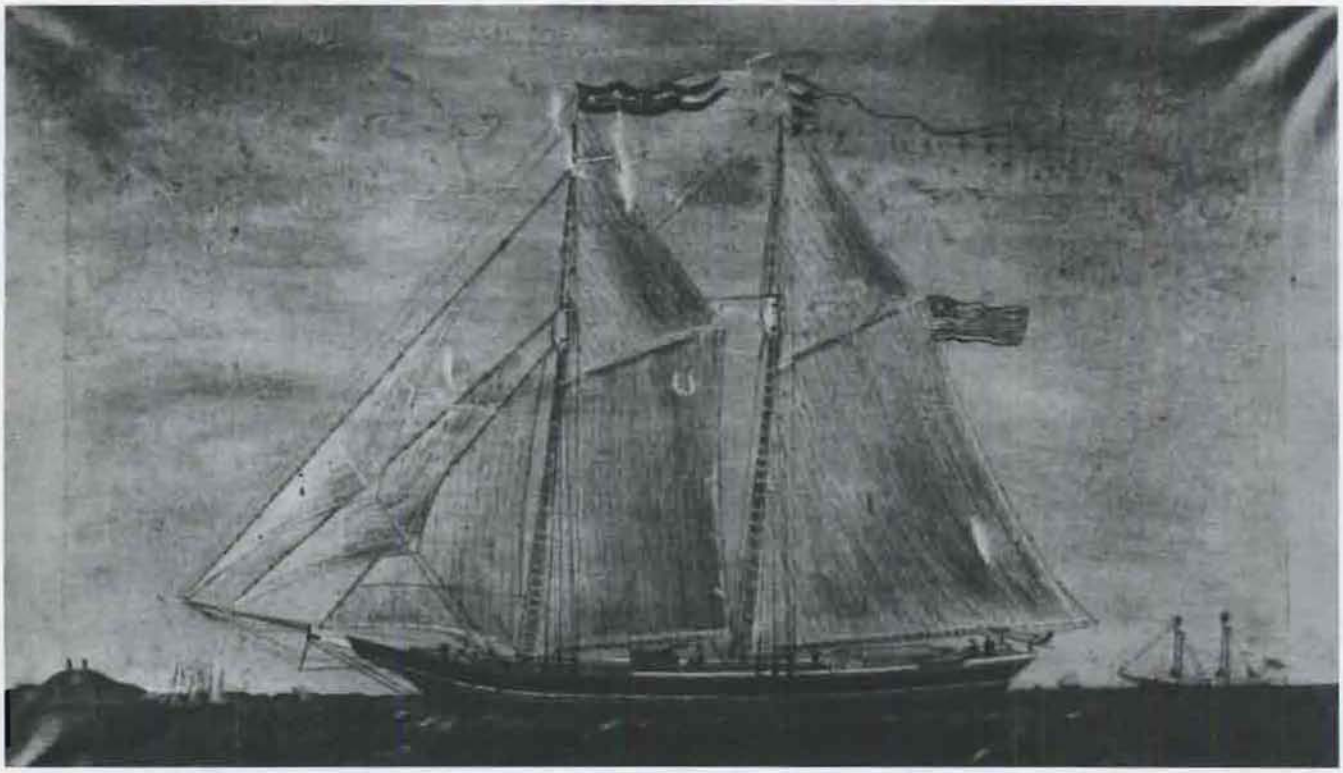


Plate 10

Schooner *Rachel A. Collins*, G. H. Lollis, master, built at Lebanon and named for the wife of canner John S. Collins. The portrait was painted in 1874 by J. H. Bell and was loaned by N. Maxson Terry of Dover.

Canning technology reached Delaware simultaneously with the Delaware Railroad; the two arrivals were undoubtedly related. However, many canneries also were sited along rivers, served by schooner and steamboat navigation. Water and rail transportation existed side by side, and served their respective communities with apparent success until both were supplanted by trucks within the past few decades.

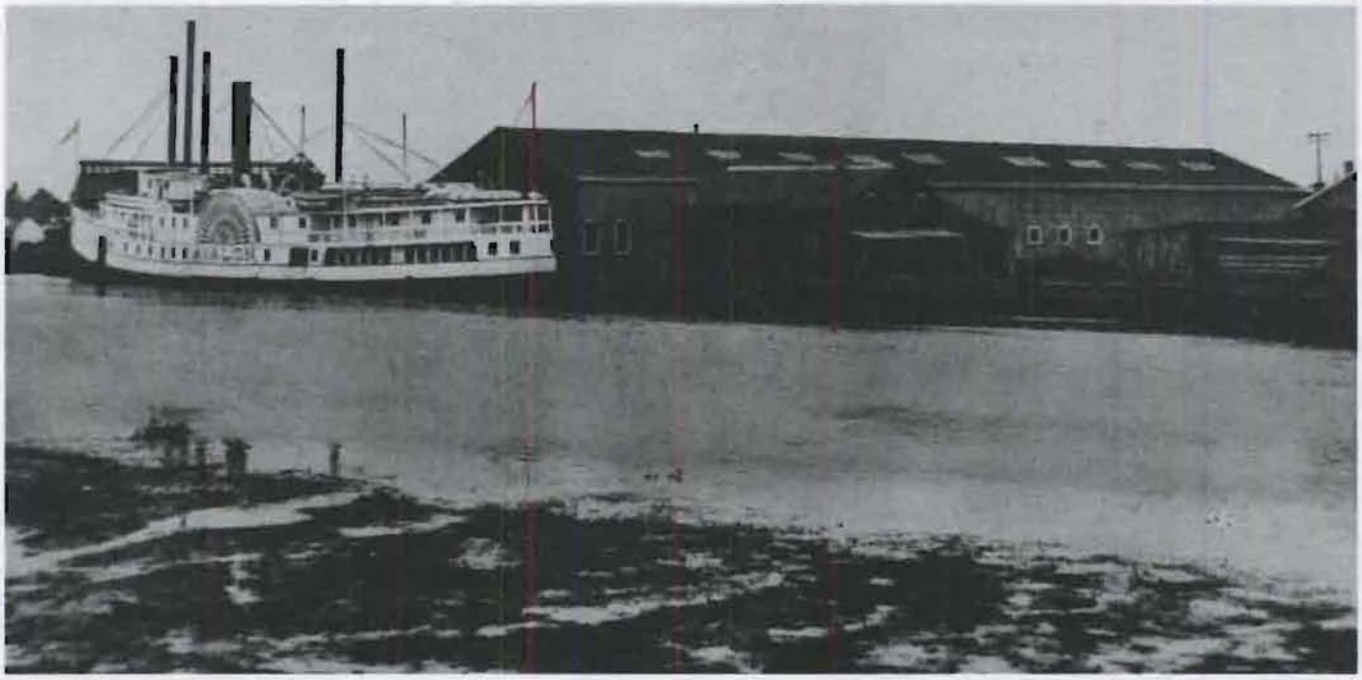


Plate 11

Steamer *Avalon* tied up at the Greenabaum Brothers cannery wharf in Seaford, from a postcard postmarked 1916, courtesy of Eleanor Jamison,of Seaford..

Each Delmarva cannery was a node in the Philadelphia or Baltimore trade network, funneling goods into those central places for distribution to the west and to world markets. With the opening of the Pennsylvania Railroad to Chicago, the Philadelphia hinterland was positioned to provide canned fruits and vegetables by rail to the growing populations of the arid west. Such firms as Heinz at Pittsburgh and Campbell near Philadelphia developed their present market share a century ago because of excellent transportation along this route.

Although most of the canneries were locally owned (TABLE 2), outsiders from the Baltimore area owned a significant number, followed by a scattering of owners from other areas. The absentee owners were clustered along the Pennsylvania Railroad (Philadelphia, Baltimore, &Washington) line from the Susquehanna River to Baltimore, the center of the canning industry.

Plate 12

Steamer *Clio,* of Odessa, tied up at Watkins' Cannery on the Appoquinimink. Husking of corn for canning is in progress in an open shed at left. From the Frances Finley Collection, Corbit-Calloway Memorial Library, Odessa.

The wreck of the steamer *Bertrand* on the Missouri River in Nebraska Territory in 1865 has provided archæologists with a window on the westward canned-goods trade in its early stages. Cans included products from Fithian and Pogue, Bridgeton, New Jersey; P. C. Tomson, Philadelphia; Aldrich and Yerkes, Philadelphia; John Annier, Philadelphia; W. H. Thomas, Baltimore; Mitchell, Baltimore; and Preston and Merrill, Boston. Canned goods on the *Bertrand* included cranberry sauce, peaches, and even pineapple from sources in the Philadelphia and Baltimore trading regions (Rock 1987).

Plate 13

Stetson and Ellison Plant #3, Houston, from a glass plate Holmes negative, courtesy Mr. and Mrs. Howard A. Sheppard, Dover.. The plant is oriented toward the railroad, with a large railside sign facing the trains. By the gate is a separate office, a common fire-protection measure found at other canneries including the one at Lebanon.

A widely-held "axiom of indispensability" of railroads has been challenged in recent years by historians, but its existence was a driving force in nineteenth-century American society (Fogel 1963). Like other social myths, such as racial supremacy and divine right monarchy, the indispensability of railroads is itself a force in history, regardless of its truth.

The New Jersey machinery connection

Oberlin Smith established the Ferracute Machine Company of Bridgeton, New Jersey in 1863, as a general machine and casting shop. Within a few years, Ferracute was the principal maker of can-making machinery. The growing cannery center of Baltimore relied upon Ferracute presses, as did the canners of the Delmarva Peninsula.

TABLE 5
DELAWARE ENTRIES FROM THE
FERRACUTE MACHINE COMPANY LEDGER 1877-1881
(not all of whom were canners)
at the Soda House, Hagley Museum and Library, Greenville, Delaware

Brown, Hansen & Co.	Wyoming
J. W. Cuykendall	Milford
W. A. Cockerell	Stanton
J. M. Chambers	Dover
Dilworth & Stewart	Port Penn
Farmers Fruit Preserving Co.	Lebanon (Rising Sun)
Green & Wilson	Greenville
Georgetown Packing Co.	Georgetown
S. W. Hall & Co.	Frederica
S. W. Hall	Leipsic
J. H. Hoffecker	Smyrna
G. M. Howell of Trenton, New Jersey	Milford
J. H. Houston, care of Capt. Twiford	Seaford
Little Creek Canning Co.	Little Creek
Lincoln Canning Co.	Lincoln
J. Thomas Lowe	Little Creek
W. H. Miller	Henry Clay
Peck, Tindall & Co.	Felton
Peck, Clifton & Co.	Felton
Richardson and Robbins	Dover
C. P. Rogers	Frederica
Reynolds & Postles	Frederica
I. T. Shallcross	Port Penn
A. W. Small	Lincoln
Stetson & Ellison	Camden
Vienna Fruit Packing Co	Seaford
J. F. S. Wroten	Bridgeville
S. C. Watkins	Odessa

Ferracute's ledger for 1877-1881 has survived (above), but it represents a period when the Lebanon cannery was not particularly likely to be buying machinery. Ferracute sold what appears to have been an entire factory to H. K. and B. F. Thurber of New York, who then owned the Lebanon cannery. This equipment almost certainly went to their new operation in Moorestown, New Jersey, touted as the largest in the world. The last owner of the Lebanon cannery, William E. Cotter, was interested in the Little Creek cannery, which bought from Ferracute.

Ferracute machinery was owned by everyone connected with the Lebanon cannery. Collins and Heverin, active in the Lebanon and Little Creek cannery companies, were partners with one another in the Marydel cannery, which in 1874 bought the 1869 Ferracute press originally owned by L. J. Wicks and company of Bridgeton (Cox 1985:12).

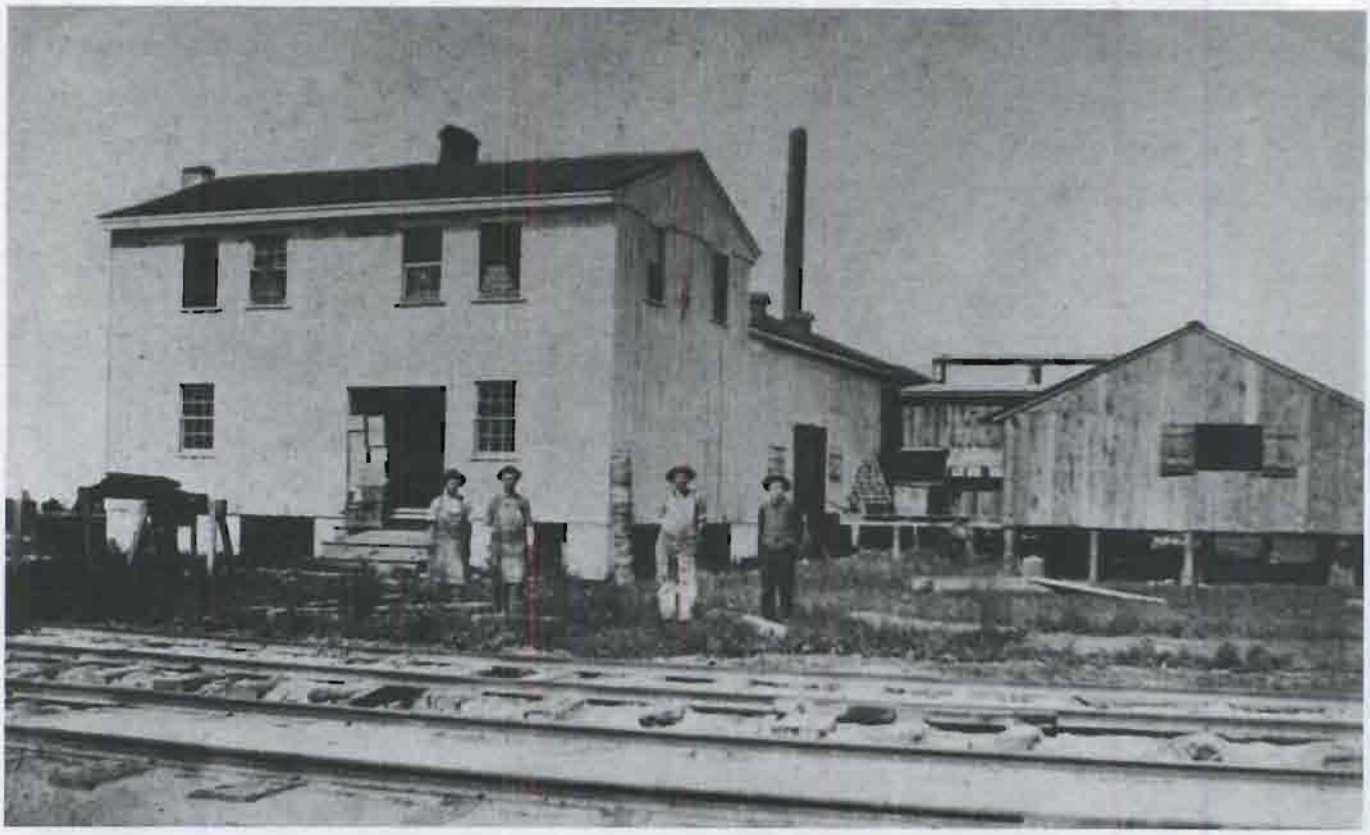


Plate 14

Four staff members of the H. P. Cannon cannery, Bridgeville, Delaware, lined up in front of their plant, along the railroad track. On the upstairs windowsill, probably the can shop, can be seen samples of their art . The buildings are entirely on piers or posts, which would leave little archæological footprint.

From the ledger (Table 4) it is obvious that Ferracute's machinery dominated the regional canning industry. The firm's "drawing ledger" or index of shop drawings, lists can dies made for the Farmers Fruit Preserving Company, for J. M. Chambers, and for Stetson and Ellison. Each Ferracute press is described in a "press card" still preserved at the company's plant in St. Louis. Original owners are listed, together with some later owners who bought parts or service for presses. Several Delaware canners are known to be represented in the press cards, but it was impossible to use them in this project; the author of the history of Ferracute, Arthur J. Cox of Bridgeton, has made notes of some, and informs the author that they reflect similar geographical connections to the ones identified in the ledger.

The largest Dover area customer was Richardson and Robbins; their Ferracute equipment included irregular dies; combination, bottom, hole, and cap dies; a beader; a blocking bolster; a power embossing press; and upright crimping machines. Considering his dependence upon Ferracute, it was not surprising that A. B. Richardson would help E. L. Jones, a young Ferracute mechanic, to set up his own machine works in Dover (PLATE 8, PAGE 26).

Plate 15

Little Creek Canning Company, 1899, courtesy of the Anold family.

Community canneries of this size typically employed local women to prepare the product while the regular staff of men made and sealed the cans. The man at far left is holding a capping iron, indicating that this plant did not boast the most up-to-date canning equipment.

First row, left to right: Louise Dillahay, Sarah Jane Smith, Annie Spencer, Lula Dare, Mrs. Ratledge, Sally Carrow, Isaac Short (born 1897), Mary Short (Isaac's mother). Second Row: Anna Mae Carter (Albert's sister), Ida Richardson, Elizabeth Richardson (Ida's mother), Frances Buckson, Lizzie Blocksom, Sophia Anold (born 1888), Sadie Wellington, May Blocksom, Ida Harrington. Third Row: Walter Pleasanton (holding capping iron), unknown person bending over, James Ratledge, Mr. White (foreman), John Seery, Fanny Muncy, unknown man in doorway, Mame Anderson, ... Clark, Viola Anold, Ella Ratledge, Sam Richardson (peering over shoulder), Lizzie Dillahay, Eddie Burris, Jennie Price, Albert Carter.

Factors in cannery site selection

Popular perception for more than a century in Delaware has insisted that towns without railroads suffered a disadvantage. Smyrna, Camden, and Odessa, to name but three, are traditionally said to have declined because Clayton, Wyoming, and Middletown were the railroad towns and they were not. The facts differ. All six towns had canneries, and all six prospered during the cannery era in varying degrees that do not appear to be related to rail transportation.

The railroad was a perceived advantage, more than an actual advantage, from a purely commercial point of view. In the end, perception won, and the rail towns appeared to be more alive and progressive, thereby attracting more progressive elements of the population. In each of these three cases, a legend arose, stating that the older town had rejected the railroad; in fact, Smyrna, Camden, and Odessa actually had campaigned to get the railroad but were bypassed because the engineers chose a more inland route to avoid bridging tidal streams. Smyrna, Camden, and Odessa depended primarily upon steamboat service, even though Smyrna and Odessa briefly had branch-line rail service as well

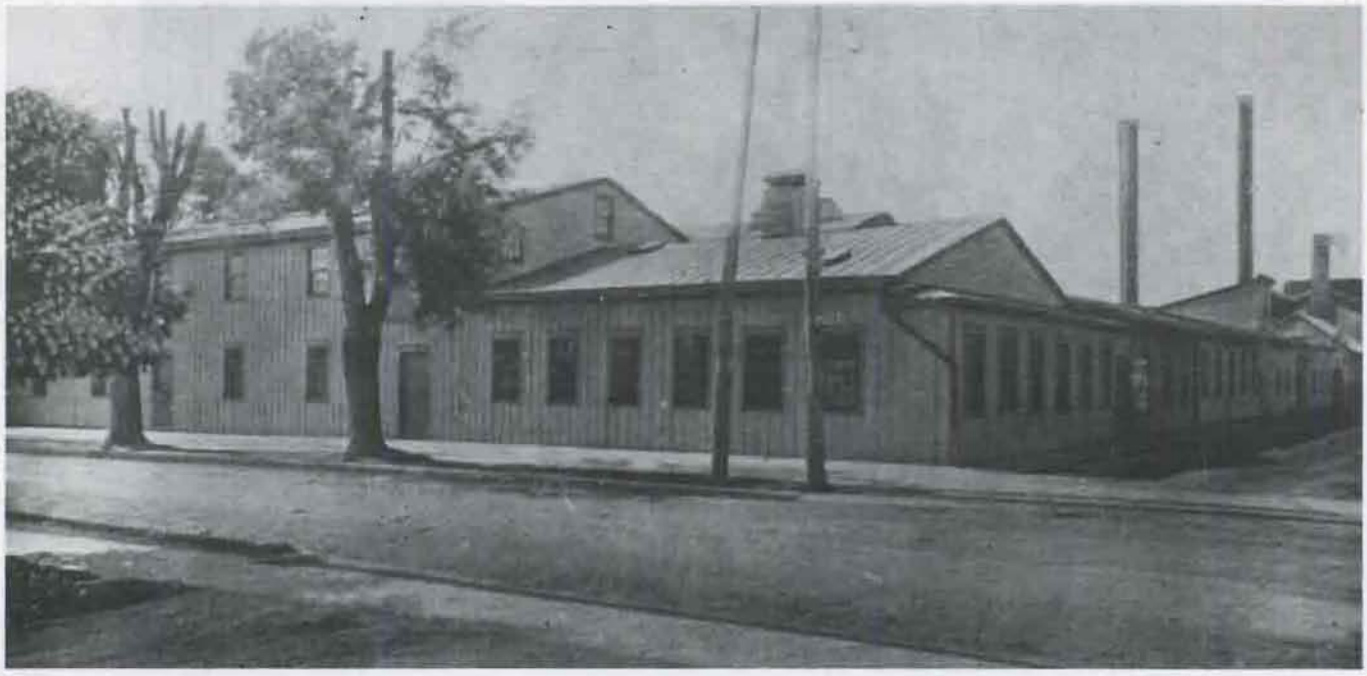


Plate 16

Stetson and Ellison's second cannery on Commerce Street in Camden, on the site now occupied by the firehouse. This plant was built after the first plant on another site nearby was destroyed by fire.

Comparisons of civic attitudes between Middletown and Odessa can be repeated throughout the state, but these two towns stand in particularly sharp contrast. At the middle of the nineteenth century, Middletown and Odessa were about equal. Each boasted a hotel, a tannery, a wagon shop, and similar local-service industries. When the Delaware Rail Road came in 1855, Middletown blossomed proudly with civic accomplishment as Odessa self-consciously shrank. Soon Middletown was three times the size of Odessa, even though Odessa shipped more peaches in 1868 than the other Delaware ports combined (Middletown *Transcript* , March 21, 1868). Both towns built public buildings, but in Odessa they were frame and in Middletown they were brick. Defensive Odessans expressed pride in their civic improvements "...notwithstanding we have no railroad." (Harriet Tatman to John Cochran, May 22, 1857, Cochran-Pool papers)

In St. George's Hundred during the railroad era, Middletown was commonly referred to as the "new" town, even though it was much older than Odessa. Even in the current generation, Middletown has celebrated its foundation from its 1861 charter, when it was already two centuries old. Odessa is perceived and advertised today as old, quaint, and Colonial, even though it has fewer eighteenth-century buildings than Middletown.

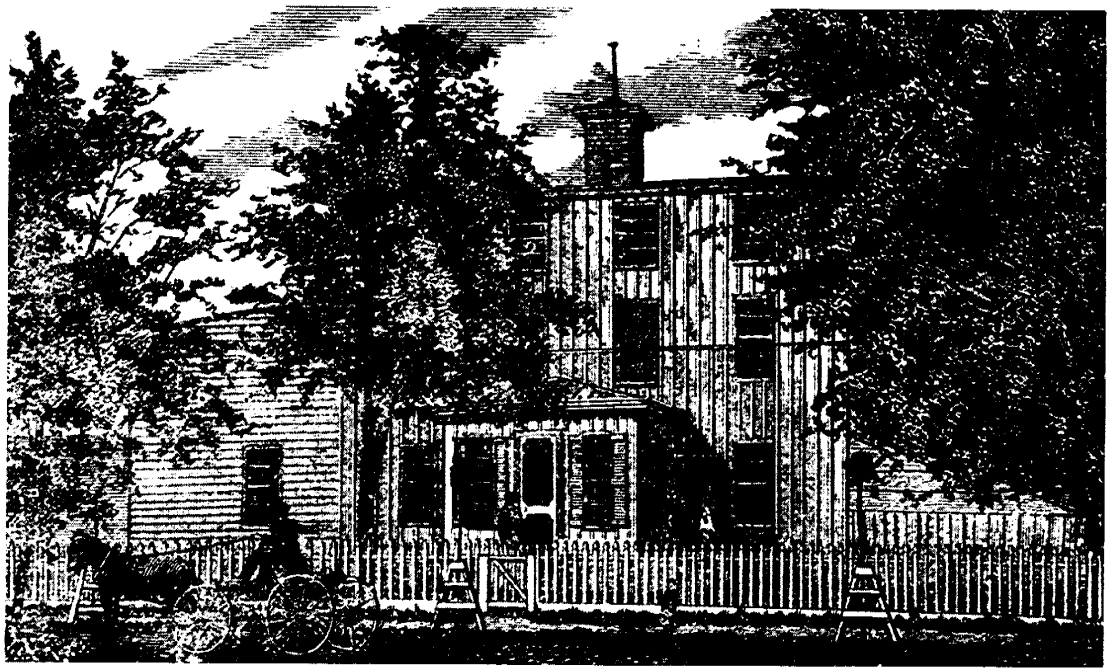


Plate 17

The 1880 J. M. Chambers cannery in Dover, near the Delaware Rail Road depot on Loockerman Street, from a wood engraving.

Plate 18

Evaporation as a food preserving method predated canning by thousands of years, but evaporators were found throughout the region even as canning grew to unprecedented scale. Charles Barker's evaporating plant at Milford, begun in 1875. From 1882, the plant had four evaporators, with a capacity of 500 baskets a day. It employed 75 hands in season. At the same time, the proprietors of the Lebanon cannery were operating an evaporator, which probably resembled this plant.

Modernization and Advantage

Why do perceptions run so contrary to historical fact? The answer may lie in a group of concepts lumped under the name of "modernization." Attention to time and timeliness, codified division of labor, and demand for rapid news communication are among the concepts included under the title of modernization.

Railroad towns enjoyed one feature peculiar to modern society: rapid communication. Shippers along railroads could deal directly with ultimate buyers in distant cities (Townsend Papers, Delaware Archives). Waterborne goods, on the other hand, were shipped to Philadelphia, New York, or other ports, where they fell into the hands of brokers. Goods from Lebanon were at different times handled by New York and Philadelphia grocery houses, who effectively controlled the market. The Philadelphia wholesale market included Pittsburgh, Cincinnati, St. Louis, Louisville, and later Chicago (Conzen 1981:342).

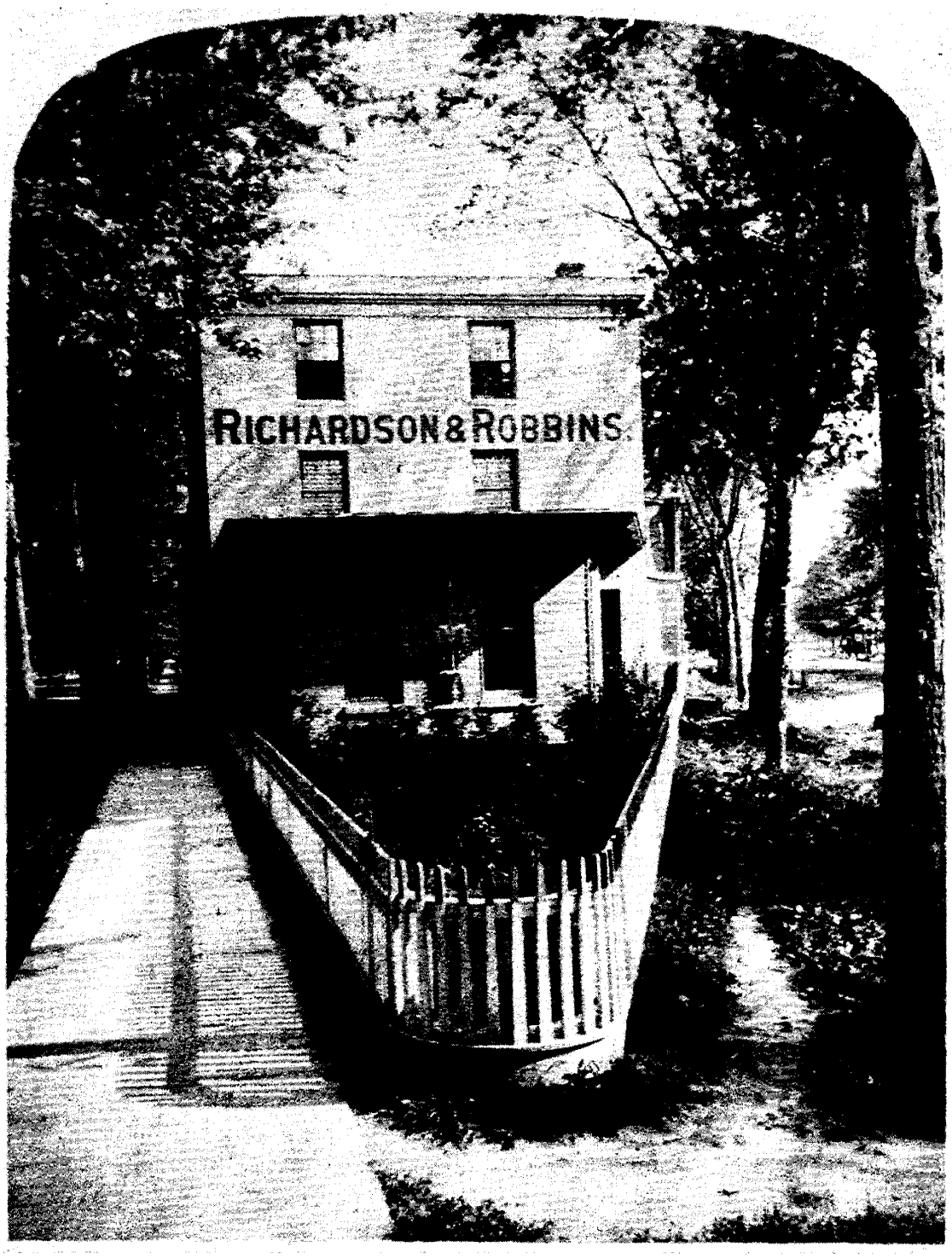


Plate 19

Third plant of the Richardson and Robbins company in Dover, on a site later occupied by the Hotel Richardson and now by Wilmington Trust Company. From a stereoptican view, Courtesy William P. Richardson

Railroad towns, with their telegraphs, were more modern in the sense that "modern" refers to a stage of cultural evolution in which timely news, communication, and speed are valued more highly than in earlier periods. Timely news was available only at railroad towns, which also enjoyed not only telegraph but daily mail and newspapers, thanks to the trains. Steamboat towns, and other towns without railroads, seldom had telegraph service or daily mail.

Lebanon was therefore doomed – or perceived to be doomed, which has the same effect – to reduced status among places. As the port for a town with no railroad, it could not attract the entrepreneurial spirits who were being attracted to central places with railroads. Even Camden, closer to the railroad, enjoyed more initial advantages, since Lebanon without a cannery was just a landing, but Camden lay at the intersection of two major roads.

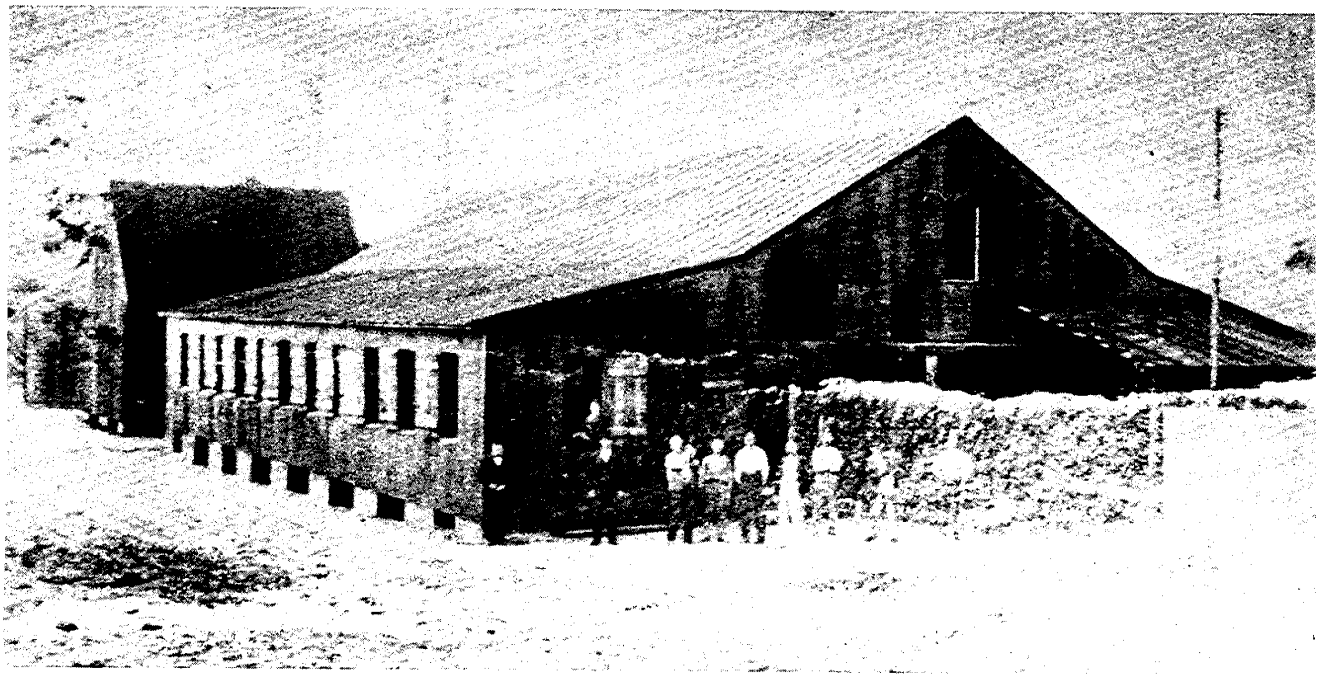


Plate 20

J. T. Postles cannery, Frederica, during the last decade of the nineteenth century. There is no sign of a can-making shop above the building, which had wings on the two sides, like the one in Lebanon. The lack of window glass indicates that the building was not used during the winter. The L-shaped brick corner pier resembles ones found at Lebanon.

By the end of the nineteenth century, the biggest and most prosperous canneries were clustered around the railroad towns and a few steamboat stops, such as Frederica, Odessa, and Fleming's Landing, along the more navigable rivers. Lebanon, far up the tortuous St. Jones, served only briefly as a cannery site before the steamboat trade was fully developed.

Economic incentives for canning in Delaware

The first canners were tinsmiths who developed methods that could be followed by workmen who would never become skilled craftsmen. The first canners at Dover, Camden, and Milford, who introduced the technology into Kent County, were all tinsmiths from New Bedford, Massachusetts. New Bedford had fallen from prominence; the California gold rush had diverted whaling ships to the California trade; competition from petroleum had reduced the need for canned whale oil, and much of the New Bedford fleet sailed from Pacific ports to exploit the Bering Sea fisheries (Morison 1961: 333). New Bedford's economic hard times, therefore, proved to be Kent County's springboard to prosperity.

When professional tinsmiths ran canneries, innovation could be expected to continue; other products came out of the shops during off seasons. The plants in Camden and Dover continued to make architectural tin, special containers, and other tin goods even after their primary businesses had become food canning. The canners who obtained patents and advanced the craft were the old tinsmiths.

Since downstate Delaware was economically and socially part of the Philadelphia hinterland, Delaware canners could be expected to benefit from that city's expansion with the completion of transcontinental railroad system. Philadelphia was the eastern terminus of the Pennsylvania Railroad, which in 1869 obtained lines to both Chicago and St. Louis, opening continental markets in the arid west for Delmarva's fruit and vegetable producers.

Delaware's rail link, the Delaware Rail Road Company, was leased to the Phildelphia, Baltimore and Washington, which was in turn a subsidiary part of the Pennsylvania system. From the other end of the line, Libby McNeill and Libby was formed in 1868 in Chicago to can meat for shipment; they would later own Stetson and Ellison and other Delmarva canneries (Minchinton 1957:256). H. J. Heinz started his Pittsburgh pickle operation in 1869 as well (Alberts 1973:8)

In fact, it was the Baltimore area that provided the most absentee owners for the Delaware canning industry, even though many of the canners' agents were Philadelphians, as in the case of the Lebanon cannery. The Maryland owners were located along the PB&W [Pennsylvania] in such places as Aberdeen and Havre de Grace (TABLE 4) and may in fact have been part of the Pennsylvania western trade.

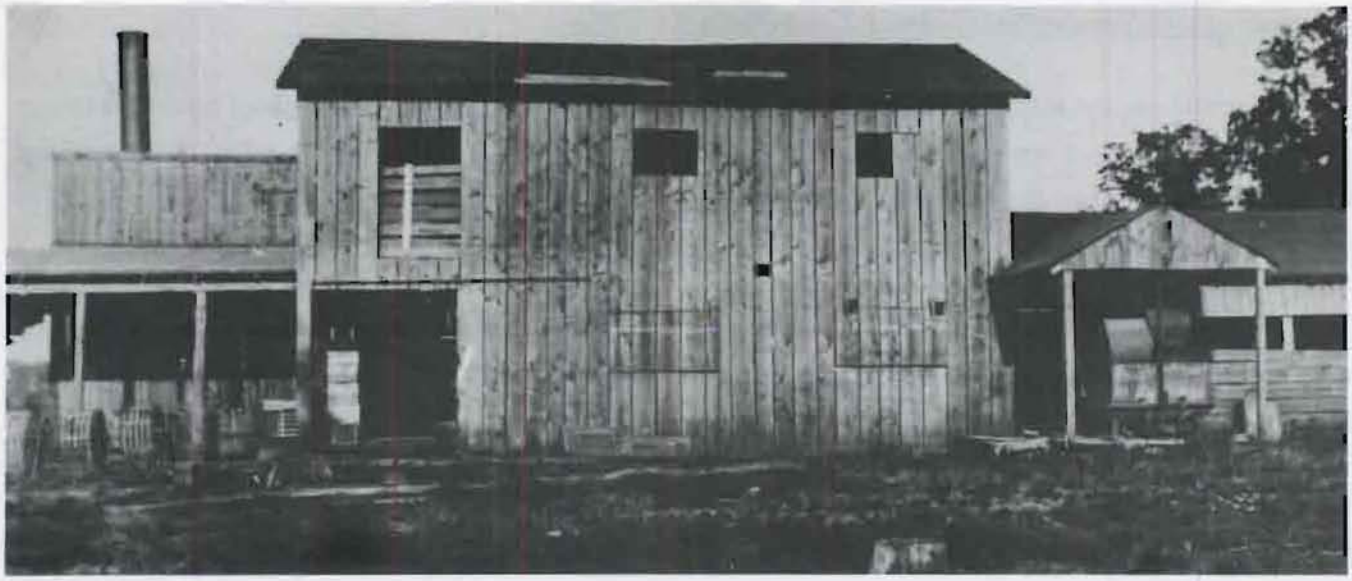
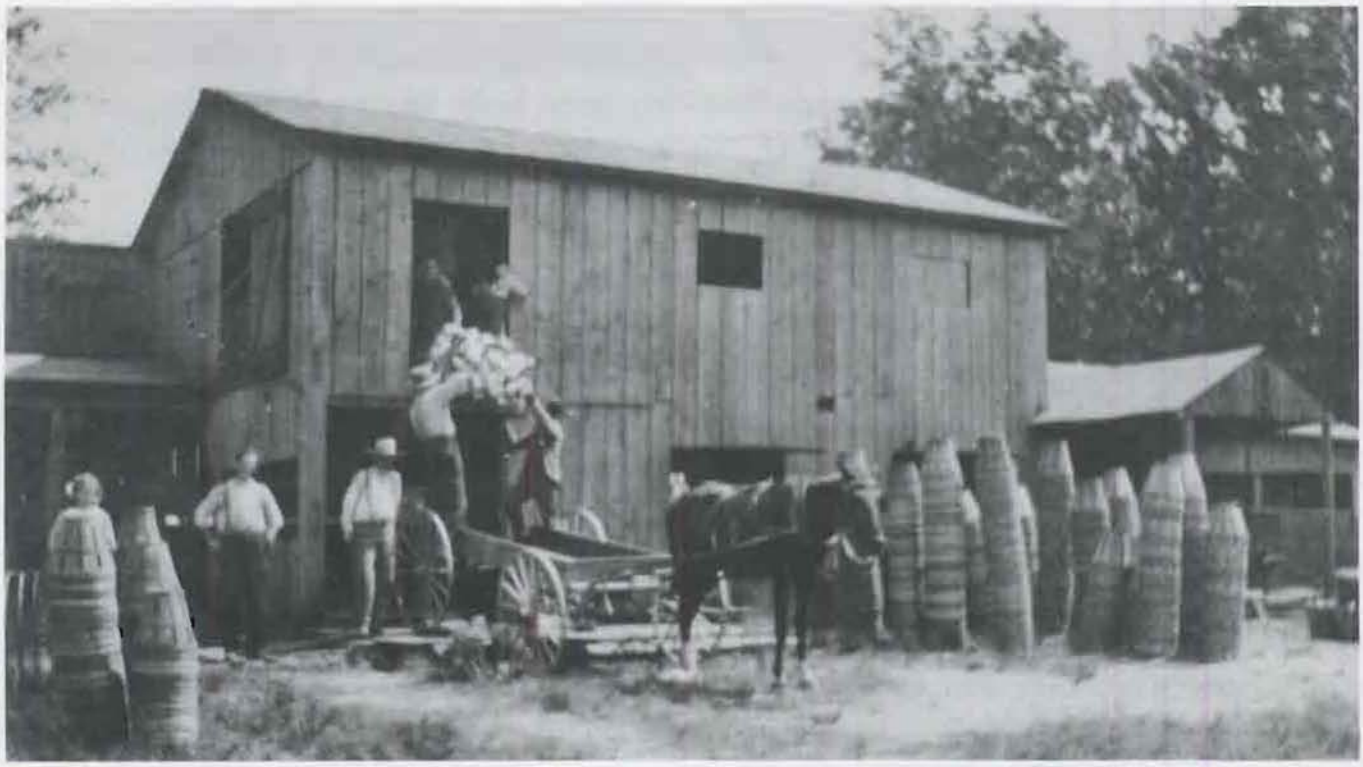


Plate 21

The cannery at Viola, above, was typical of the small seasonal plants that were common in Delaware. In the open shed at right was the scalding apparatus, consisting of two steel baskets that were lowered into hot water. Below is a view of typical preparations at Viola. Baskets are stacked on the ground and workmen are delivering empty cans to the loft, since the plant did not make its own cans.

Plate 22



Beginnings of Canning in Central Kent County

Commercial-quantity canning in Delaware began when two young New England tinsmiths set up shops and branched out into food processing. There had been earlier experiments, but Delaware folklore insists that the mighty Delaware canning industry began in Alden Richardson's kitchen in 1856. Richardson himself perpetuated the legend in later years.

Alden B. Richardson and George M. Stetson were brothers-in-law, tinsmiths who had lived in New Bedford, Massachusetts where they had learned their trade. They came to Delaware and set up shop first in Wilmington and then at Camden, making and selling tinware.

After a short time, in 1853, Richardson moved to Dover and they both took new partners, forming the firms of Stetson and Ellison at Camden and of Richardson and Robbins at Dover. Richardson and Robbins established a separate cannery business in 1856. Although Stetson and Ellison are said to have made cans among other tinwares in 1856, their cannery was not founded until 1864, by which time Richardson and Robbins were already well established. Richardson and Robbins first packed poultry products in 1865, and continued for a century thereafter. Staple products of R&R over the years were boned chicken, chicken soup, hams, plum pudding, all products that did not depend upon seasonal crops. The physical plant and working conditions at "Richardson's factory" were therefore different from other nineteenth-century canners.

These two firms would be among the most stable, enduring, and successful of Delaware canning firms, as well as the most innovative during their early years. Later, they would be among the most conservative. An observer who knew the R&R firm in its later years called it a "one telephone" plant, where the firm's president conducted all the business in the old autocratic manner.

Stetson and Ellison and Richardson and Robbins eventually were absorbed by larger and more progressive canners, which closed the last of their operations about twenty years ago. Of all the Kent County canneries, only the Wheatley operation at Clayton remains open, as a freezer plant of the Campbell Soup Company. Those vegetable canneries that survive today employ freezing to preserve crops and keep plants running when fresh vegetables are unavailable. Purely seasonal canning has all but vanished.

The Camden and Dover canners continued to make cans and use hole-in-cap technology after the sanitary can was introduced. A Stetson and Ellison letter of 1915, now in the Delaware State Museum collection, indicates that the company was buying hole-and-cap cans from an outside source. Although Richardson and Robbins eventually adopted the modern can, some specialty cans continued to be handmade; its can shop equipment remained intact until about 1965, when it was bought by a collector and moved to Lubec, Maine (Rier 1985).

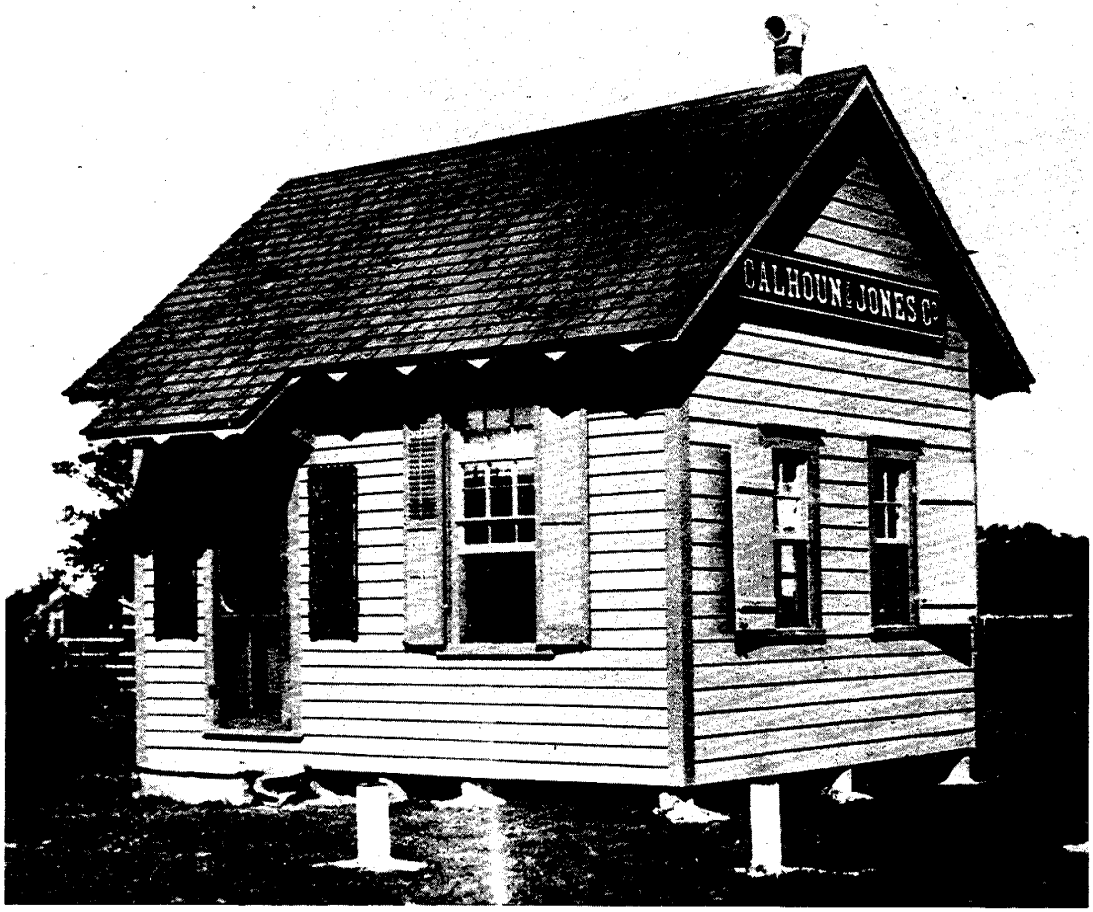


Plate 23

Office of the Calhoun and Jones cannery on Race Street in Georgetown, Delaware. The plant also manufactured fertilizers. Separate offices were standard fire protection measures; the one at Lebanon may have resembled this one. Courtesy of Virginia Chipman Boyer.

Some smaller nineteenth-century canneries (Plate 21, page 45) bought cans from outside manufacturers, but most canneries were also can shops until the first decade of the twentieth century, when the "sanitary" can was introduced. The end of can making meant a shift in the workforce. Thereafter, canneries would operate on a strictly seasonal basis unless they canned meat products that were available year round. In 1865, Richardson and Robbins first packed chicken and turkey, as their advertising proclaimed, "expressly for Excursionists and Travellers for their luncheons."

Cannery Fires

When canneries made their own cans, they were year-round operations, heated in the winter by the fires necessary to melt the solder. Each can maker had a bench, equipped with a gasoline, coal gas, or charcoal heater. Since the can shops were generally in the open frame cannery buildings, they presented a very real year-round fire danger. To minimize the impact of fires, canneries often were housed in several buildings with room between to prevent the spread of a destructive fire; this was the case at Lebanon.

Frequent cannery fires were a fact of life. The insurance records are filled with amendments to fire insurance policies recorded the rapid growth of factories, punctuated by conflagrations. Insurance companies responded by re-insuring the canneries with several companies, spreading the risk throughout the insurance industry. The insurance declaration for the Richardson and Robbins plant of 1881 was a printed pamphlet, which the Kent County Mutual company distributed to other companies for their participation.

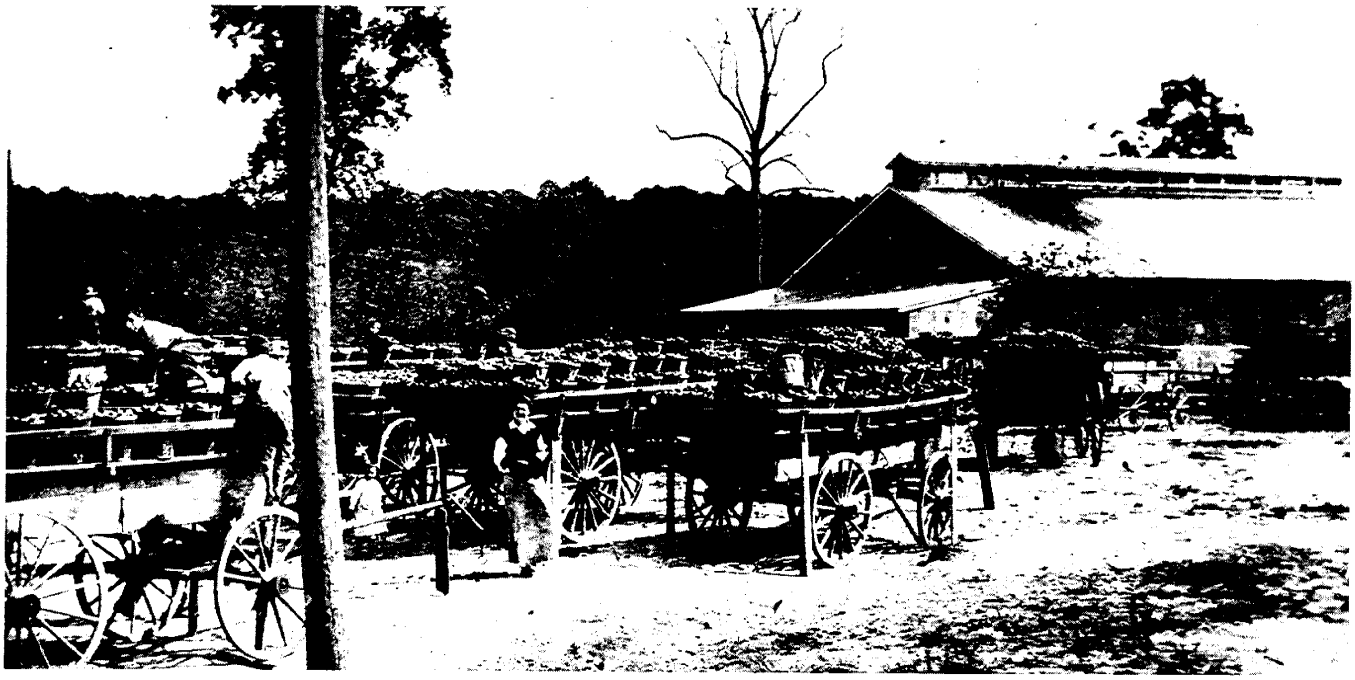


Plate 24

Wagons full of tomatoes lined up at the Winters and Prophet Canning Company in Milton. This memorable backup in 1913 occurred when a boiler breakdown halted the canning operation. Canneries were typically taken apart and rebuilt between seasons, in an effort to avoid such breakdowns. Some canneries, notably Richardson and Robbins, had redundant boiler systems for this reason. The Lebanon cannery always had more than one boiler.

During the early days of the industry, a burned plant would be rebuilt bigger and better after a fire. These were years of expansion, when plants frequently were modified between seasons. Stetson and Ellison moved out of the proprietor's backyard following the 1884 fire to ā new plant west of Camden (PLATE 16), where the present Camden-Wyoming fire house stands. It was the 1884 fire that inspired establishment of the Camden fire company. Dover's Robbins Hose Company is named for a canner whose company financed its establishment.

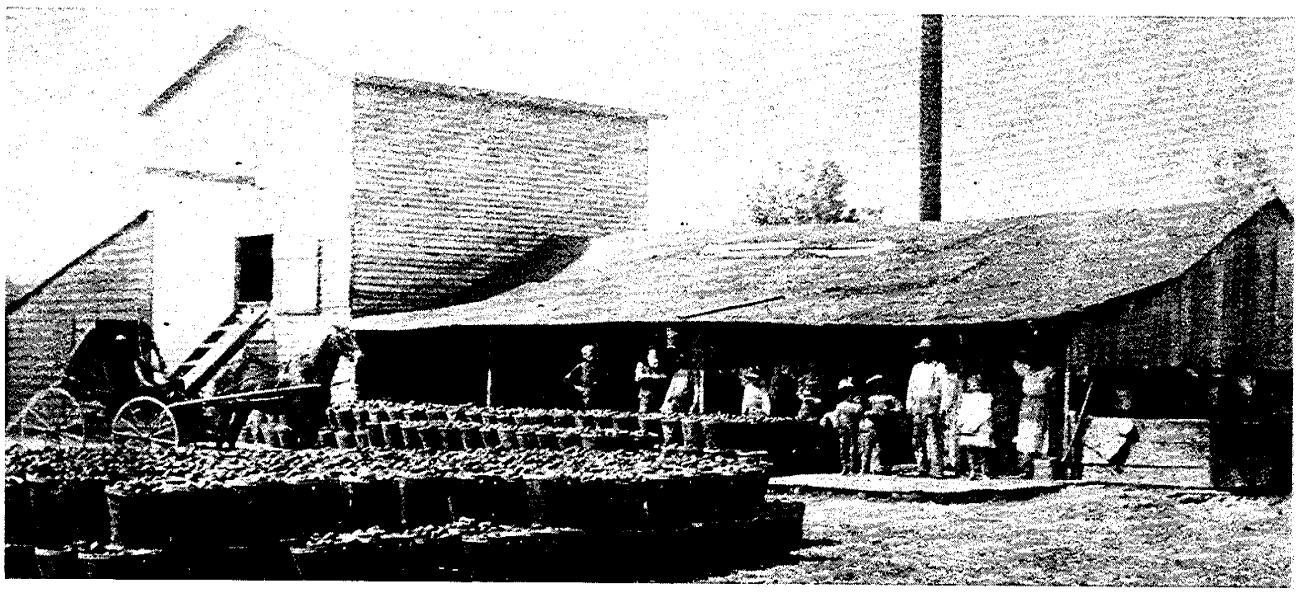


Plate 25

Cannery of William McClintock ("Clink") Minner at Masten's Corner, Delaware, about 1905. The Minner enterprises in this area included a basket factory, another important adjunct of the canning trade. Masten's Corner had neither rail nor navigation. Photo courtesy Alice Minner Knapp.

Ancillary Industries

Each cannery was the center of a cluster of economic activity, including a number of trades and industries required to support it. Aside from the farms and their support systems, there were machine shops, gas works, and shipping companies that revolved around the canning industry. The Diamond State Telephone Company began when Senator H. A. Richardson recognized the need for communication between his plants and his suppliers, notably the E. L. Jones machine shop.

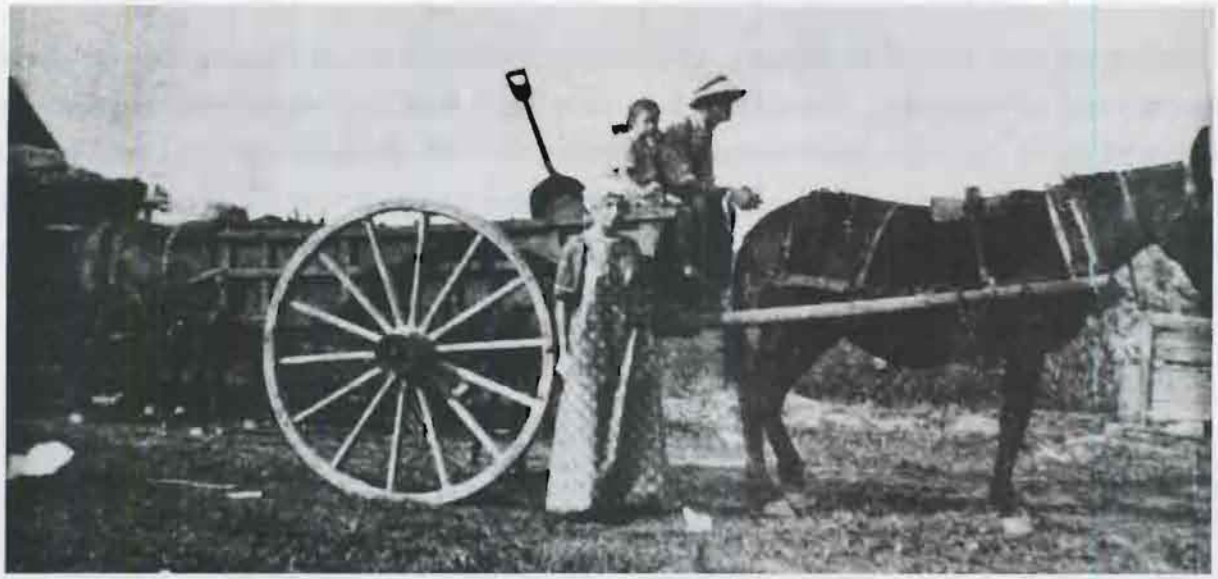


Plate 26

Waste products of canning have been valuable as animal feed and for other purposes. This dump wagon full of tomato skins had just called at the J. Colby Smith cannery in Willow Grove, Delaware. Alfred Ford and his daughter Priscilla are on the wagon, and his stepdaughter Beatrice Bennett stands by. Cannery waste is still used as animal feed, sometimes on farms owned by canners. Can-making waste from Lebanon was used to fill holes in roads.

E. L. Jones was born in Bridgeton, New Jersey, in 1853, at the beginning of the canning industry's growth period. He learned the machinist's trade at the Ferracute factory in Bridgeton, which manufactured can-makers' presses and other equipment for the canning trade. Under the sponsorship of Richardson and Robbins, he moved to Dover in 1881 and established a machine shop and foundry at the corner of North and New streets, near the location of the Dover Gas Light Company. The foundry and machine shop made "can makers tools, foot presses, dies, square shears, solder molds and cutters, forming rolls, solder blocks and coppers, springs, parts of dies, etc." (*Delawarean* August 13, 1881) The original partnership of Jones and Howell was dissolved and E. L. Jones and Company moved to a site on Forest Street (PLATE 8) where it operated almost as long as the cannery.

Dover Gas Light Company, ancestor of the present Chesapeake Utilities Corporation, was established as a rosin gas plant in 1859 and purchased in 1867 by A. B. Richardson , who converted it to make coal gas.

Both Stetson and Ellison and the Lebanon cannery owned schooners before the Rising Sun cannery interests established a steamboat line between Lebanon and Philadelphia. Canneries supported the steamboats, which in turn played a role in their communities similar to the railroads' role among the inland communities. On the Murderkill the *Frederica* served that town's canneries and the *Clio* (PLATE 12) carried canned goods from Odessa to Philadelphia. Interlocking ownership of the steamers and canners meant that a community's fortunes were virtually dependent upon the fluctuating fortunes of a single business.

Plate 27

John S. Collins, about 1928

Plate 28

Capt. John C. Durborough

Two pioneers of Kent County canning are shown in their natural surroundings. John S. Collins later developed Miami Beach, where he is shown in this picture near the end of his life. Captain John C. Durborough, a member of the Rising Sun firm, was also master of the *Mary U. Githens*.

CHAPTER 4

HISTORY OF THE SITE

THE VILLAGE OF LEBANON stands on land which was part of a larger tract called Tidbury. This 400-acre holding was laid out by the Kent County Court in 1683 for Thomas Williams. Tidbury lay on the south side of Tidbury branch or creek and on the west side of the Dover (now Saint Jones) River, at their confluence. Across the branch lay the tract that eventually became today's Wildcat Manor, home of the Hunn family. On the Wildcat tract, near the mansion house, was an important shipping point called Forest Landing, which served the areas now known as Dover, Camden, and North Murderkill Hundred.

During the colonial period, the lower King's Road ran from the Dover area to the Frederica area skirting the meadows on one side and the unsettled forest on the other. It crossed Tidbury Branch near the present State Street bridge. The old crossing was a planked ford through the marsh and a footbridge for pedestrians. The upper road, through the present site of Camden, followed higher ground above the head of navigation, generally crossing streams at mill dams. The road westward from the mouth of Tidbury, called the Forest Landing Road connected at Camden with the Choptank Road to Maryland.

Lebanon was a commercial center during the age of sail. Throughout the eighteenth and nineteenth centuries, bulky and heavy goods were moved almost exclusively by water. Lebanon served as the landing for the St. Jones drainage, including Camden, Hazlettville, Dover, Rising Sun, and, later, Wyoming. Businessmen in the inland towns ordinarily kept wharves and warehouses at their landings, and commonly invested in ships.

Forest Landing lay at the eastern end of the portage between the Choptank and the Delaware, now State Route 10, then known as the Choptank Road. This portage was a major overland route from the beginning of the eighteenth century, and probably earlier.

Transpeninsular portage was important to the commerce of Delaware, and to the prosperity of the entire Middle Atlantic region. North-south transportation consisted of water routes, such as the Delaware and Chesapeake bays, interrupted by portages across land barriers, including Delmarva and New Jersey. Delaware's first railroad was a portage from New Castle, Delaware to Frenchtown, Maryland. When the Delaware Railroad was begun, it was intended to connect Delaware Bay traffic at Dona's Landing, east of Dover, with the Nanticoke at Seaford. In preparation for the coming of a railroad, Kent County's first

scheduled steamboat traffic was established at Dona, rather than at Forest Landing, which had long been the traditional port for Dover. After the Delaware Railroad changed its orientation to an all-land route, Lebanon regained its position as the port for Dover and Dona became a ghost town.

Shipbuilding began at Lebanon in the eighteenth century. In 1888 Scharf (1131) commented, "The village has long been noted for its ship-building, having turned out in recent years a 3-masted schooner of 800 tons burden for the trade to the West Indies and the Gulf of Mexico. It is nothing unusual to see 3 or 4 schooners at anchor here at a time."

The typical schooner serving Lebanon through the middle of the nineteenth century made between eight and twenty-eight round trips per year to Philadelphia. The schooner *T. P. McColley* made eighteen trips in 1867 and carried goods for Camden merchants Graham and Lord; Wharton A. Gildersleeve; Robert Lord, Jr., J. C. Durborough, Thomas Pickering of Lebanon; John H. Jenkins, and Lebanon storekeeper William Dyer. Camden fruit canners Stetson and Ellison received 30 boxes of tin.

The ships not only linked Lebanon to Philadelphia, they tied central Kent County to the entire Mid-Atlantic region. The schooner *Stetson and Ellison*, owned by the Camden cannery and commanded by one of its partners, purchased ships' goods and repair work from businesses in Centerville, Maryland; Camden, Frederica, Bowers, and Philadelphia as well as Lebanon. (Richardson Collection, HSD, Freight Records book 1, MS 6217)

Thomas Pickering, a farmer who owned part of the Tidbury tract, owned interests in several of the Lebanon schooners. In 1883 he bought a half interest in the little two-masted schooner *Hattie Hall,* 29.18 tons, from Allabeda Kirkley of Leipsic for $300. She was built at New Town, Maryland in 1871, 51.28 feet in length, 18.6 feet in breadth, 5 feet depth of hold (Pickering papers).

He also had a financial interest in the much larger three-masted schooner *Minnie A. Bonsall,* captain John L. Bonsall, which engaged in the coastal grain trade out of Lebanon. She measured 458.83 tons, 153.5 feet length, 37 feet breadth, and 11.5 feet depth of hold. Pickering held the mortgage on Captain Edward Stubbs' schooner *Jennie D. Blocksom* as well (Pickering papers).

The Farmer's Union

Although the area around the mouth of Tidbury Creek had been a landing since settlement, organized shipping companies developed only in the middle of the nineteenth century. In 1855, the legislature passed a bill allowing Alexander Jackson, William Slay, Henry Pratt, John Hunn, and William

Lewis, to sell stock in a company to be called the Farmers Union of Kent County. The corporation was authorized to "Purchase and receive ... not to exceed ... at any one time, fifty acres, and to build and construct wharves, granaries, store-houses and other needful buildings, and improvements for the storing of grain and other produce, at some suitable and convenient place as the said Company shall deem advisable, and to buy or build and own one or more vessels suitable for navigation, and to employ persons to sail or run the same in the shipment of grain and other produce. ..." These incorporators were largely businessmen from North Murderkill Hundred.

The original act must have been flawed, for two years later, it was amended and the Farmers Union was "declared to be a body politic and corporate under the name of the Farmers Union of Kent County and by that name shall have succession for twenty years and no longer...." The incorporators at this time included only William Lewis and John Hunn of the original five, and thirteen others (Enrolled Bills 1855, p. 289; 1857, p. 275, Delaware Archives)

Limited-duration corporations were the rule, rather than the exception, at that time. There was a deeply rooted American aversion to perpetual corporate entities. Even banks were chartered for a term, after which their business was to be "wound up" and the stockholders repaid their investments.

On July 1, 1859, Daniel Mifflin deeded a wharf lot, containing 65 square perches, to the Farmers Union of Kent County. Officers of the Union then were Henry Pratt, John Gooden, Jr.; Thomas L. Madden, Andrew Calley, and Benjamin Stradley (Kent County Deed Book Q-4:193). In 1867, the property was taken up by a firm called Graham, Durborough, and Company, which apparently was a simple partnership consisting of John G. Graham, Captain John C. Durborough, James Grier, and Joseph L. Bonsall (Kent County Deed Book N-5:486), all of whom were involved in Lebanon shipping. This firm must not have had a separate existence, for when the Union's charter expired on March 2, 1877, the land reverted to Mifflin, whose heirs in 1890 conveyed the wharf to the Lebanon Navigation Company, which had some of the same participants (Kent County Deed Book I-7:268).

Collins, Geddes and Company

In 1869, Collins, Geddes and Company built a fruit cannery on the bluff above the St. Jones River at Lebanon, adjacent to the old Hunn mill seat. At that time, there were fewer than ten canneries in all of Delmarva, two of which were within a few miles of Lebanon (May 1937: 436).

The partners were John S. Collins, a nurseryman of Burlington County, New Jersey; Samuel Geddes of Union County, Pennsylvania; and Jacob Brown of Kent County, who managed the company's affairs locally.

Samuel Geddes, (1814-1896), had recently moved to Delaware from Lewisburg, Union County, Pennsylvania. By trade he was an iron manufacturer, although there is no evidence that he was also a tinsmith. In 1864, he sold his interest in Union Furnace for $15,000, at a time when even the least efficient ironworks was fat with wartime profits.

John S. Collins (1837-1928) came to the cannery from a successful career in the nursery and fruit business in Moorestown, New Jersey. After 1890, he turned his northern interests over to younger members of his family and moved to Florida, where he grew tropical fruits to be shipped north on the new railroad lines then under construction. By 1909, he owned 4500 acres on the ocean side of Biscayne Bay, with four and a half miles of ocean front and a mile on the bay. On this ground he grew avocadoes and mangoes; to serve his fruit farm, he built a canal through the barrier beach, followed in 1913 by a bridge to the mainland. The fruit farm eventually was developed by the Miami Beach Improvement Company, of which Collins was the president (Blackman 1921). The tract is no longer agricultural.

Jacob Brown (1825-1897), the local manager of the company, later operated the highly successful cannery at Rising Sun, a short distance west of Lebanon. He was not a tinsmith by training.

The Lebanon plant site consisted of two acres purchased from the Dyer family in 1869. Under the "Star" brand, they began canning tomatoes, peaches, and other products, probably during the 1870 season. Can labels were printed at Geddes Sons, 724 Chestnut Street, Philadelphia, and the wholesale agent was C. P. Knight and Brothers, Philadelphia.

The first Kent County Mutual policy on the cannery was issued at about the time it was built. There was a two-story frame building, 80 by 24 feet with frame wings on the east and west sides one-story 10 by 80 feet, used as a canning factory, and a frame boiler house at the north end of the main building measuring 18 by 19 feet (Kent County Mutual Declaration 3318, Delaware Archives).

The complex grew rapidly. A two and a half story lodging house west of the cannery, measuring 50 by 24 feet, was insured in 1870. The dormitory was divided into rooms, but was not plastered. A cook shed was attached to the rear (Kent County Mutual Declaration 3660). During that same second year, the two-story cannery was doubled to 166 feet long, with ten-foot shed wings east and west as before. The addition extended the building 86 feet northward, including the boiler house. A steam boiler located in the old boiler house, now the center of the building, was "well secured in brickwork." Upstairs, can-makers

used charcoal furnaces to heat their irons. There was a coal shed about three feet from the south end of the building (Kent County Mutual Declaration 3925).

In 1871 the company's premises were again described as expanded. Ā scalding house, 32 by 30 feet, a new boiler house measuring 18 by 24 feet with two bricked boilers, a coal shed, all joined to the west side of the main canning house. Some distance away was a wood shop for making crates (Kent County Mutual Declaration 3635).

More buildings were added in 1872, including a heated building 24 by 14 feet, about eight feet from the cannery, which was furnished with a bed, two desks, and a bookcase. About 30 feet from the building was a shed with racks for fruit, measuring 30 by 45 feet. Another building was added to the north of the cannery 50 by 24 feet, with ten-foot side wings (Kent County Mutual Declaration 3660).

Jacob Brown, the on-site manager, sold his share in the company to Collins and Geddes in 1872. Collins bought out Geddes in 1874, and changed the name of the firm to John S. Collins and Company. The new labels, copyrighted in 1874 and printed by Geddes Sons, bore the Collins name alone. He listed himself, at 260 South Front Street, Philadelphia, as the wholesale agent.. Like the old labels, the Collins labels proclaimed that the plant packed tomatoes, peaches, peas, blackberries, raspberries, and strawberries, but the new label listed asparagus as well.

By 1874, the main cannery measured 24 by 216 feet, plus wings ten feet wide on the east and west sides. A boiler house stood to the west of this structure. Tomato sauce and catsup were made in a building 18 by 40 feet added to the west of the boiler house. A fruit cooking room measuring 32 feet square adjoined the cannery and the boiler house. By now there were two boarding houses, each 20 by 32 feet (Kent County Mutual Declaration 4629). See Figure 2, page 6, for a conjectural reconstruction plan based upon these descriptions.

In its prime, the cannery was said to have been the largest in the United States. The following notice appeared in the Dover *Delawarean* in 1870:

> "...A story and a half frame building, about 150 feet in length by 50 in depth, stands on the high bank facing the creek, with which communication is maintained by means of a long elevated platform or pier, where necessary supplies are received and from which goods are shipped on board of schooners for New York and other eastern ports. On approaching the building we found a number of wagons from which fruit was being unloaded and hundreds of baskets of peaches waiting their turn to be pared, scalded and sealed in air-tight cans. ... On the day of our visit about three hundred hands were engaged in the various branches of the business about the premises. ... Last week 56,000 cans were put up, and this week it is said the number will touch 65,000. A basket of peaches will fill about ten quart cans. The hands here work from early in the morning until 10 or 12 o'clock at night, and on the day of our visit closed 16,090 quart cans, containing over 1600

baskets of peaches. They expect to put up 400,000 cans of fruit this season, including tomatoes, we suppose."

A schooner, named the *Rachel A. Collins* in honor of the owner's wife, was built at Lebanon in 1873 to serve the cannery (Plate 10, page 32). Canning was in a boom period, and the Lebanon cannery was riding the boom. In July 1874, workers packed 8200 cans of peas in one ten-hour shift. Collins also operated an evaporator, in which he dried apple and peach peels and apple cores. According to the *Peninsula News and Advertiser* for September 18, 1874, he bought the U. S. patent on the Alden process to make jelley from such waste products.

In early December of 1874, the cannery was putting up apple jelly and making cans for the next year's production. Only about forty workers were employed, as compared to 300 in season. Suddenly, in the middle of the night of Thursday, December 3, fire was seen leaping through the cupola of the huge frame building. Soon the entire plant was involved, causing a loss estimated at $48,000. Two dwellings and the receiving house, also owned by the company, were not damaged. The *Delawarean* for December 5 reported that the ground was littered with tomatoes, catsup, and jelly. It was a blow from which the Collins company would not recover.

The Milford *Peninsula News and Advertiser* for December 11 raised the possibility of arson, and suggested that Lebanon might not be the best place to rebuild the cannery:

> The permanent loss of this establishment would be a great public calamity; and we are glad to know that the energetic proprietors intend to rebuild and resume operation as speedily as possible. We do not know what may be the special local inducements which attract them to the particular locality of Lebanon, but venture to suggest to the company that before rebuilding there they canvass the inducements which Milford offers for a great canning establishment like theirs. This is the very heart of one of the largest fruit growing sections of the Peninsula. The town is the second in size in the State; and labor could be had in abundance. We have navigation as good as at Lebanon, and railroad transportation with communication by steamers with New York via Lewes. It would seem to us that this is beyond comparison, a more eligible location for their great business than the petty and obscure village of Lebanon. Please consider it gentlemen.

Collins rebuilt the plant on a smaller scale. During the 1875 season, peach parings were being converted into jelly, according to the *Delaware Tribune* for October 7. By 1876, there were three tinsmiths and seven can makers listed in the Delaware Directory for Lebanon. But the second plant was not a success. Collins lost it in a sheriff's sale to William Paschall, an affiliate of the firm of H. K. and B. F. Thurber and Company, New York grocers, in 1878.

The Thurbers operated the fruit drying factory with six machines in 1878, but after the 1879 season they sold out to William Eastman Cotter. They were building a new plant at Moorestown, New

Jersey, which they would advertise as the world's largest. After the 1881 season, Cotter did not operate the Lebanon cannery. He bought the Little Creek cannery on July 9 of that year, just at the beginning of the season.

Fire on Saturday morning, May 17, 1884, again destroyed the cannery. According to the *Delawarean* for May 24, 1884, the fire could be plainly seen from the steeple of Dover's court house. The cannery, sheds, and the home of the widow Dyer were consumed with all their contents. Since there was no fire brigade in Lebanon, the citizens worked to save other nearby buildings. The newspaper account stated that the idle cannery, owned by William Cotter, was leased to a firm that would have taken over the following week. By then, Cotter was operating the Little Creek cannery with his father-in-law. That plant also burned, the next year, in October 1885. Cotter's frequent fire losses prompted sinister rumors about arson.

After the second fire, the cannery was not rebuilt; the sheriff again sold the property, which was bought by Cotter's wife, Charlotte. She, in turn, lost it at sheriff's sale in 1900. Thereafter the cannery site was cultivated as part of the adjacent field for about sixty years. When the duplex apartment building was erected on the south end of the old cannery property, the north end of the site was allowed to lie fallow and soon grew up in trees.

Steamboating

The natural channel of the St. Jones has never been suitable for large vessels. The lower 12 miles, from Lebanon to the mouth, was only four feet deep in 1880. The upper nine-mile stretch to Dover had a low-water depth of only two and a half feet. In the River and Harbor Act of March 3, 1881, Congress authorized a channel three feet deep and 100 feet wide at the mouth of the river, to be protected by a jetty. The project was modified in 1884 to include a depth of six feet at mean low water. Work began in 1885, and was nearly finished in 1888. A cutoff about a mile below Lebanon was completed in 1890. Thereafter the channel was maintained below Lebanon at a depth of six feet (Chief of Engineers 1908: 213).

An account in 1887 reported that there were fifteen fishing boats at Lebanon, manned by twenty fishermen who occupied five fish houses and harvested terrapin and clams, as well as fish (Herman and Siders 1986:198).

The Lebanon Steam Navigation Company was organized in 1887, when the Delaware General Assembly passed a bill declaring "Thomas Pickering, William Ridgeway, John C. Durborough, George H. Gildersleeve and such other persons ... a body corporate and politic ... by the name ... of Lebanon

Navigation Company." These were the Rising Sun cannery interests, and some of the same interests that had invested in the Farmers Union. Like the earlier firm, the new company was authorized to exist for twenty years. Its purpose was to "conduct and carry on the business of owning, controlling, using and employing vessels to be propelled by steam or sail or both for transportation between the village of Lebanon on St. Jones Creek in Kent County and the city of Philadelphia and such other ports or places as may be deemed necessary. ..." The corporation was further authorized to purchase wharves and other facilities at Lebanon, and whatever equipment the company needed to carry on its business. The first stockholders' meeting was scheduled for the first Saturday in April 1888.

The new company moved quickly; in 1887 it purchased a waterfront tract from the Lord family. Three years later, it purchased the old Farmers Union wharf, where some of its stockholders had been operating under the name of Graham, Durborough, and Company. Facilities included a wharf, a warehouse, a granary built over the water, an office, a ladies' waiting room, and a scale house. The company's two waterfront properties were separated by the old Hunn forge site, still owned by the Hunn heirs.

To carry out the trade, the company bought the four-year-old screw steamer *James F. Holt*, of Milford, which had been built on Indian River, Delaware. They had her lengthened from 71 feet to 106 feet at the Enoch Moore yard in Wilmington. Renamed the *Mary U. Githens*, she entered the Philadelphia-Lebanon trade under Captain John C. Durborough. The owners of the steamer were principals in the cannery at Rising Sun, and she was named for the ten-year-old daughter of the company's Philadelphia agent and backer. Mary U. Githens, the girl, was reportedly unhappy with *Mary U. Githens*, the ship, which she perceived as less elegant than a steamer named for one of her classmates.

Her career was not all routine, however. She was the first "large" steamer to ascend the St. Jones to Dover on July 8, 1887, when she brought coal for the dredge *Atlantic*, which was working to clear a six-foot channel to Draper's wharf at the foot of Water Street. Lebanon was the practical head of navigation, although some vessels occasionally ventured to Dover. Steamboats customarily turned around in the basin at the mouth of Tidbury. The *Wilmington Morning News* reported on July 9, 1887 that the "little steamer" from Lebanon had made the trip the day before and with some exaggeration proclaimed that "...the capital of the state is a seaport this morning."

The steamer did not always follow her route. On June 5, 1888, off Billingsport, New Jersey, she was involved in a minor accident. Ordinarily she called at Barker's Landing and Bowers on the St. Jones; Port Mahon near the mouth of Little Creek; and Wilmington. She boasted private staterooms, ladies' and gentlemen's saloons, a dining room, electric lights, and steam heat. Roundtrip fare between Philadelphia

and Lebanon was $1.50 and meals were 25¢ in 1900. Cargo manifests for the *Githens* and other Lebanon ships are housed at the Historical Society of Delaware. A typical round trip took three days.

Her agent was Githens, Rexsamer, and Company, produce merchants on Front Street in Philadelphia. Benjamin Githens had interests in several canneries on the Peninsula, which he helped start (Letter of Marion C. Winn to E.D.Bryan, n.d.).

The *Githens* caught fire at the Lebanon wharf on the night of March 3-4, 1904 and burned to the waterline. William Carter and Frank Butler were staying on board as watchmen, for the boat was laid up for painting. The fire began in the engine room and quickly spread up to the upper decks. Flames leaped to the warehouse, but were extinguished, while the steamer drifted downstream and sank.

She was to become the best remembered of the Lebanon boats. A series of reminiscences on the last years of the *Mary U. Githens* appeared in the Wilmington *Every Evening* in August and September 1960. Respondents to an inquiry in the paper about the fate of the *Githens* remembered that the ship also had carried sturgeon and peaches in season to Philadelphia, and streetcar horses to Kent County, destined to end their days as farm horses.

According to the respondents quoted in the newspaper, she was replaced by a vessel called the *Vigilant,* which sank some years later at Barkers Landing. Also on the line were the steamers *John P. Wilson* and *City of Dover,* which never inspired the folklore that surrounds the *Mary U. Githens.*

The *Wilson* was built by Neafie and Levy of Philadelphia, and entered service in September 1904. She had a steel hull, three decks, was 131 feet long in the keel and 27 feet beam. She could make the twice-weekly dash to Philadelphia in eight and a half hours under the command of Captain Durborough and a crew composed mostly of his family (*Delawarean* November 4, 1905). A new corporation, the Dover and Philadelphia Navigation Company, took over the Lebanon steamboat property in 1907, finally deeding its inactive assets to Samuel Harrington in 1923.

As Lebanon's steamboat era began to close, the River and Harbor Act of June 25, 1910 authorized a major improvement of the river. At the mouth, a mile-long jetty was to project the channel into Delaware Bay. Another sixteen cutoffs were to be dug, reducing the length of the river from the Bay to Dover to eighteen miles. During the next decade, local parties worked to obtain title to the proposed cutoffs at no expense to the government, as the law provided. The cutoffs finally were built, but too late to serve steamboats. Trade on the river dropped from 120,291 short tons in 1913 to 6,384 tons in 1916 (Chief of Engineers 1918: 417-419).

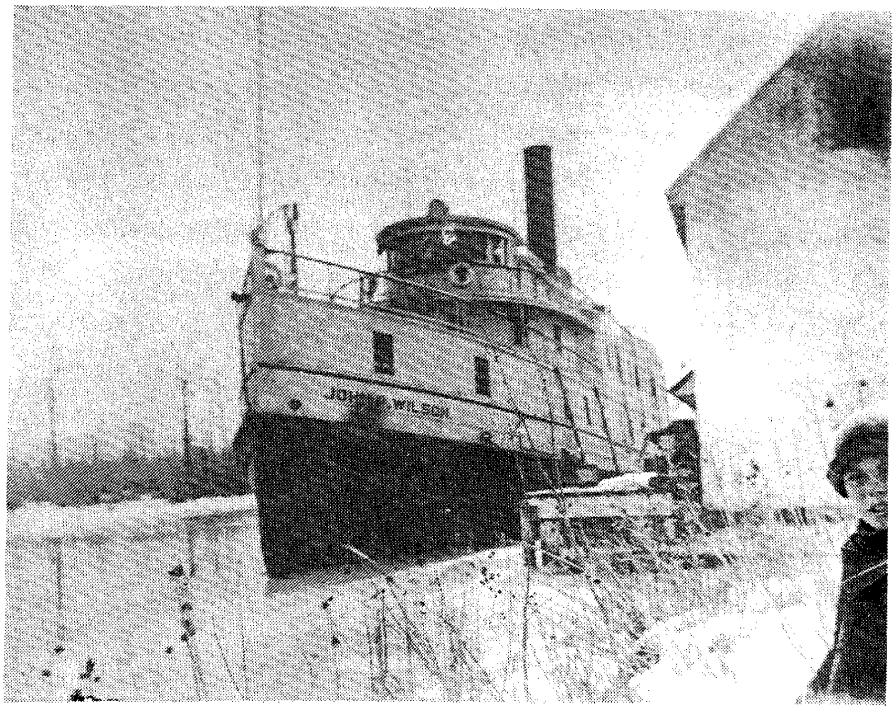
The government acquired the right-of-way for the last cut in 1925, after scheduled steamboats no longer ran. There is speculation that the motive was not to improve navigation, but to improve the river's ability to flush effluent from the Dover wastewater plant, which had been built at the old Draper's wharf. The last steamboat called for a load of freight at Lebanon around 1938.

Decline

Establishment of the Lebanon Steam Navigation Company probably marked the peak of the village's prosperity. The waterfront along the river was lined with granaries, docks, stores, and offices. Lebanon had its own post office since the cannery opened in 1870. Coal, lumber, and store goods entered central Kent County through Lebanon, and grain and agricultural products left for Philadelphia through here. Although folklore states that competition from the railroads killed waterborne traffic on the Delaware, the coastwise trade reached its peak of prosperity a generation or two *after* the Delaware Railroad opened in 1856.

Widespread automobile transportation and paved roads finally spelled the death of waterfront commercial towns up and down the Delaware drainage. Lebanon was no exception. The Dover and Philadelphia Navigation Company sold its facilities in 1923. The steamboat company's buildings crumbled. An old man living in a float house on the marsh sold turtles to Philadelphia caterers whose buyers arrived in cars, and the new highway department dug away the hillside to build the roads that had made the steamers obsolete.

Plate 29



Steamer *John P. Wilson* at Lebanon, with the company warehouse at right. The warehouse still survives as a frame with a roof only. Albert Taylor looks on. Photo courtesy W. Thomas Pickering

CHAPTER 5

PREVIOUS INVESTIGATIONS

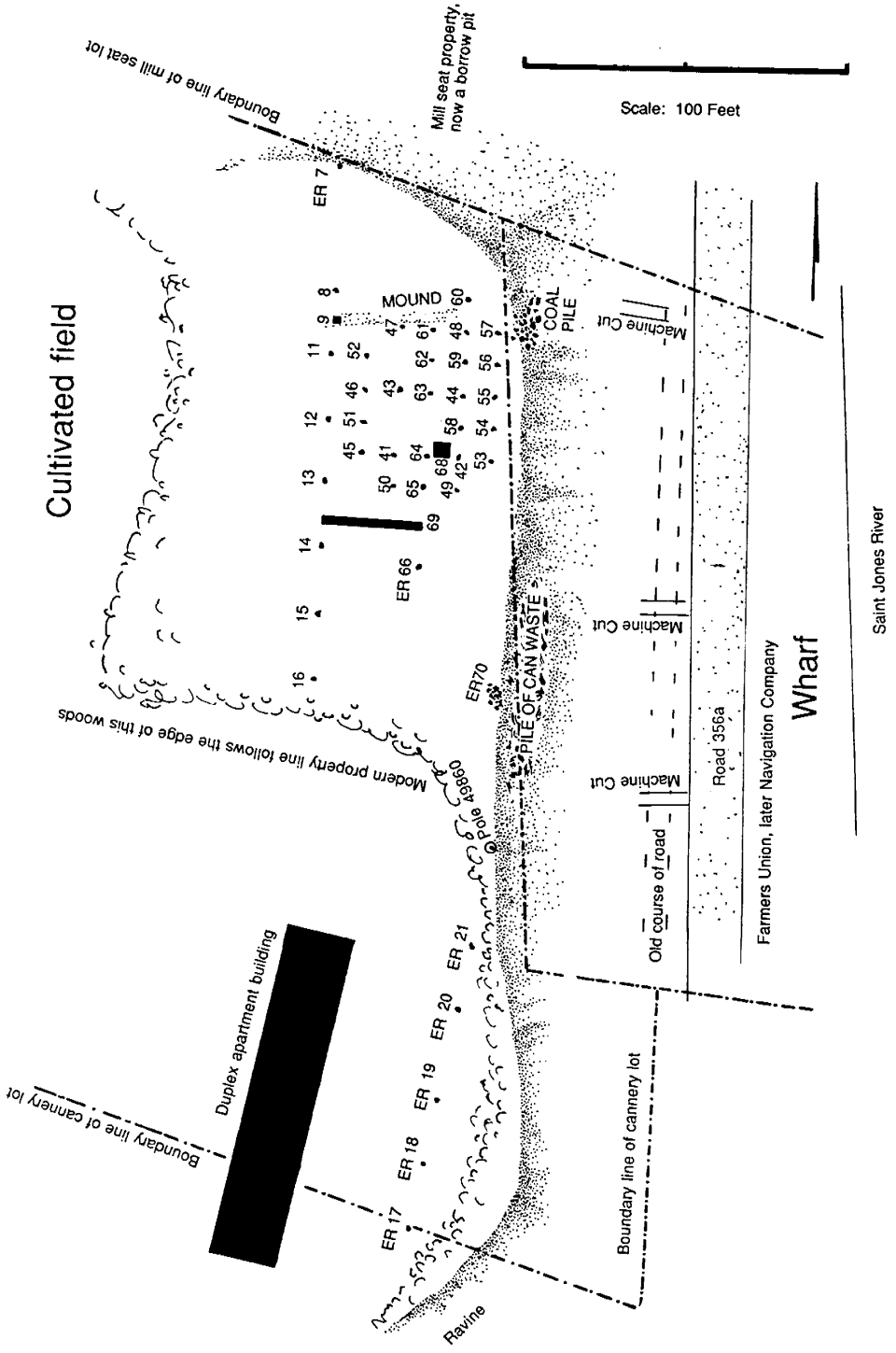
INITIAL TESTING AT THE CANNERY SITE was reported in a previous publication (Heite and Heite 1989). Since the present project continues the excavation register of the first test, a summary is in order. A standard numbering system was used, in which a single designator identifies the stratum and the artifacts from it. Appendix 1 of the current report contains a continuation of the numerical register, reflecting the 1989 work, with a description of each unit and the artifacts found in it. Each whole number denotes an excavated unit and the unstratified material from it. Buried levels are identified by a letter suffix. The Island Field Site accession number for the material is 88-228, followed by the ER number.

The site of the Collins, Geddes and Company cannery lay on the bluff overlooking the Saint Jones River. The wooded part of the cannery lot shows no evidence of recent cultivation. There are no buildings on the site, but local residents remember remnants of the old structure along the top of the ridge. The ground is littered with brick fragments, coal, and charcoal.

Since the cannery site deed refers to a 25-foot setback from the road along the river, it was necessary to reconstruct the nineteenth-century topography in order to locate the cannery lot. All the property deeds from the middle of the nineteenth century forward refer to a line 25 feet west of the road. In order to locate the original road a Gradall machine was used to dig three cuts into the flat ground between the present road and the toe of the slope. The machine revealed a beach-like profile, with deep sand to a depth of two feet and more in all three cuts. In the southernmost cut, adjacent to the toe of the slope, the machine cut through twenty inches of old road metalling that had survived against the toe of the hill. The top layer was black oily sand, overlying a layer of rust. Below a layer of coal clinker was a thick layer of oyster shell fragments resting on brown sand. This succession of metalling reflects the succeeding practices in road maintenance up to the beginning of the twentieth century. Until just after World War II, the wharf buildings occupied the present Road 356a right-of-way, forcing the road closer to the hill (FIGURE 6). When this road alignment is accepted, cannery lot deed descriptions fit the topography.

Figure 6

Map of the cannery site and its environs, showing Phase II tests



The northerly part of the cannery lot was part of the land Daniel Mifflin bought from Hutchinson in 1783 , and became part of the Samuel Mifflin share of the estate of Nathaniel Hunn. Isaac Draper lived on a different part of this tract, but there is no documentary indication of a building here before the cannery. A firm then styled "Brown, Geddes and Company" bought about two and a half acres from the Dyer family in 1869 and began construction on the cannery.

Topography

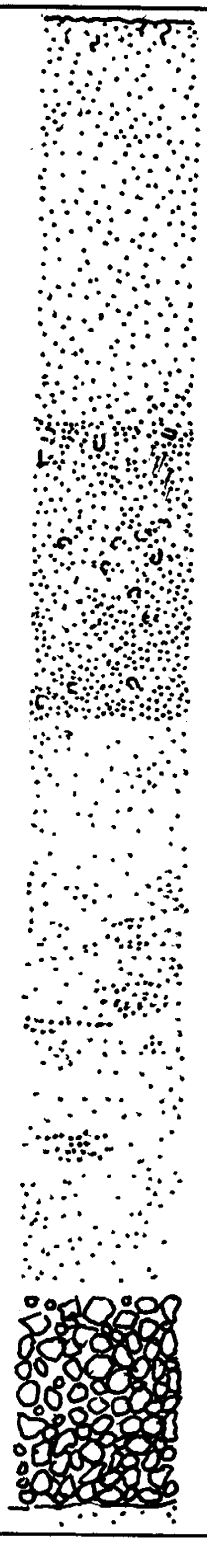
On the north, the edge of the canning plant site is marked by a deep borrow pit that almost completely occupies the portion of the mill seat tract where the 1793 Hunn bloomery forge had stood. The plant site has an artificially flattened appearance, both on the topographic map and on the ground. There is a small ridge running across its north end that appears to be manmade. Otherwise, no above-ground structures survive from the cannery.

There are, however, many surface indications of the cannery location. A large mass of sheet metal waste has been dumped over the edge of the bluff, indicating that can manufacture was carried out nearby. Piles of broken brick attest to salvage operations after the cannery was destroyed.

Phase I and Phase II archæological investigations

The first step in the archæological elucidation of the cannery site was a line of shovel test pits, numbered 7-9 and 11-16, roughly along the reputed eastern boundary of the cannery lot as interpreted in the current deed record. Surface indications pointed to the cannery lying east of this line, since building debris and can-making waste was concentrated along the crest of the hill.

The first test, ER 7, was placed at the north end of the cannery lot, on the edge of the hole that now occupies the mill seat property. The topsoil was a rich, brown sandy color and texture typical of this locality. A yellow sandy subsoil was encountered at 12" and was opened to a depth of 16" when it was apparent that all cultural layers had been penetrated. Many of the other test pits in this area would exhibit a similar profile, but with considerable variation in the depth of the overlying brown soils. Because of obstacles, ER 8 was placed on the line at 40 feet from the beginning point. A square unit, ER 9, three feet on a side, was sited on a linear mound that appears to be a manmade feature, 50 feet from the beginning point. Aside from a large amount of coal and clinker, the unit was indistinguishable from other parts of the site. No evidence of buried features was uncovered.



Profile of ER 68

ER 68 Brown loamy sand topsoil

----------13 inches below surface

ER 68a Trashy layer of brown loamy sand

----------22 inches below surface

ER 68b Compacted yellow cloddy layer
with brick and ash

----------40 inches below surface

ER 68 c Layer of brick bats, mortar,
coal ash, and building debris with
very little soil

----------47 inches below surface

Figure 7

Beginning with unit 11, the rest of the tests on the traverse were placed at intervals of twenty feet, to unit 16, at 160 feet from the beginning point. This last unit uncovered robbed-out brickwork consisting of small fragments of brick and a quantity of loose mortar. Although the line crossed the entire wooded area, its length is still 56 feet short of the final total length of the cannery building. However it was situated, the cannery must have covered much of the duplex apartment lot as well as the woodland.

After consultation, it was decided that more tests were necessary to delineate the extent of the cannery remains in the wooded area to be disturbed by the project. Additional test pitting was chosen as the method of finding the activity areas, to be supplemented by some larger test pits situated in areas where features might be found. The pits, numbered 41-67, were placed first on a grid of twenty feet, which was then infilled at ten-foot intervals in areas that seemed to be closer to the center of the site. Extreme variations in topsoil depth and content gave evidence that the site contained a complex array of features.

Plate 30
Canmaking waste in the bank, as first uncovered

Eventually it was possible to draw an inverted topographic map of the site's subsurface contours by plotting the depths of the brown topsoil in all the test pits . This inverted topographic map indicated the presence of a large hole, such as a cellar, but the maximum depth of brown topsoil was three feet at only one point near the center. It was apparent that yellow fill dirt had been mistakenly identified as subsoil, but the slumping of fill had produced a telltale depression. After the plot was made, a test square, ER 68, five feet square, was sunk into the apparent middle.

Sure enough, the hole proved to be a cellar, four feet deep, with a compact fill of yellow soil that had been indistinguishable from subsoil in the limited viewing area of a shovel test pit. Only a quarter of the unit was opened to the full depth, where a layer of robbed brick rubble was found lying on the earthen floor together with piles of coal ash that had burned *in situ.*

Another test, ER 69, consisted of a trench two feet wide and thirty feet long, cutting generally across the line of the probable factory location. Since the building was largely of wood, substantial foundations should be absent. Subsoil features included a set of plow scars and one postmold in a post hole. The subsoil on the eastern half of the trench was slightly deeper and slightly harder than on the western part, and a clear line of demarcation was visible, even though there was only a half-inch difference in elevation on either side of the line. This harder subsoil was interpreted as a possible dirt floor.

Over the edge of the bluff, cannery remains were more abundant. Workmen in the cannery tin shop had apparently thrown their scrap over the hill, onto the Farmers Union lot. None was found on the steep bluff area owned by the canning company, where an overhead ramp was supposed to have been located.

The cannery waste has been explored for many years by Dr. Bryan, who turned over his collection to the authors for inclusion in this report. Examination of Bryan's collection and a cursory collection made during the first survey under this project indicated that there was much more to be learned about industrial-grade tinworking from the waste on the site. Accordingly, after consultation, the ER 22 canmaking waste collection was expanded to bring in a more comprehensive collection of the waste.

A pile of robbed brick, ER 70, was located on the brow of the hill. Since none of the fragments were complete, this deposit probably represents a brick salvager's waste pile, as did the bricks found in the cellar hole. Measurable sides of all bricks were tabulated in hopes that different building phases might be distinguished.

CHAPTER 6

EXCAVATION NARRATIVE

THE FIRST TASK IN THE CANNERY SITE EXCAVATION was to clean away the accumulated trash and brush from the site, which took the DelDOT crew several days during December 1988. Excavation began December 27 and ended May 20, 1989. A well-preserved length of foundation (FIGURE 9) revealed in the first cut provided an auspicious starting-point.

Today the cannery site belongs to three different parties. The south part of the lot contains a duplex apartment house. The waste dump, formerly owned by the steamboat company, remained a separate parcel until the Department of Transportation purchased it. The cannery site itself belongs to a real estate firm that has subdivided the former Richardson farm into small estates.

Investigations were confined to the northeast corner of the cannery lot, the documented location of the main building (FIGURE 8). On the north and east, the high flat site is bordered by large trees, mostly cherry and locust, evidently the remains of a hedgerow that once edged the high ground. Before the apartment house was built, about thirty years ago, the farmer plowed to the edge of the hill. Since then, the lot north of the duplex apartment has been allowed to grow up in trees, some of which are becoming fairly large.

When the current work began, the site was a thicket of fallen trees, limbs, underbrush, trash, and young trees. The first investigations (Heite and Heite 1989) consisted of shovel test pits and limited larger excavation units, one of which (FIGURES 6,7, ER 68), plumbed the cellar hole. The tests had demonstrated the presence of significant cannery remains, which subsequently were determined to be eligible for listing in the National Register of Historic Places (APPENDIX 3).

Because part of the site could not be avoided, it was determined that data recovery was in order. Data recovery was divided into three tasks: the cannery site, the canmaking waste dump, and a watching brief on other areas of the project. Peculiar conditions of each task required specialized procedures for each task.

Figure 8

Site plan for data recovery project

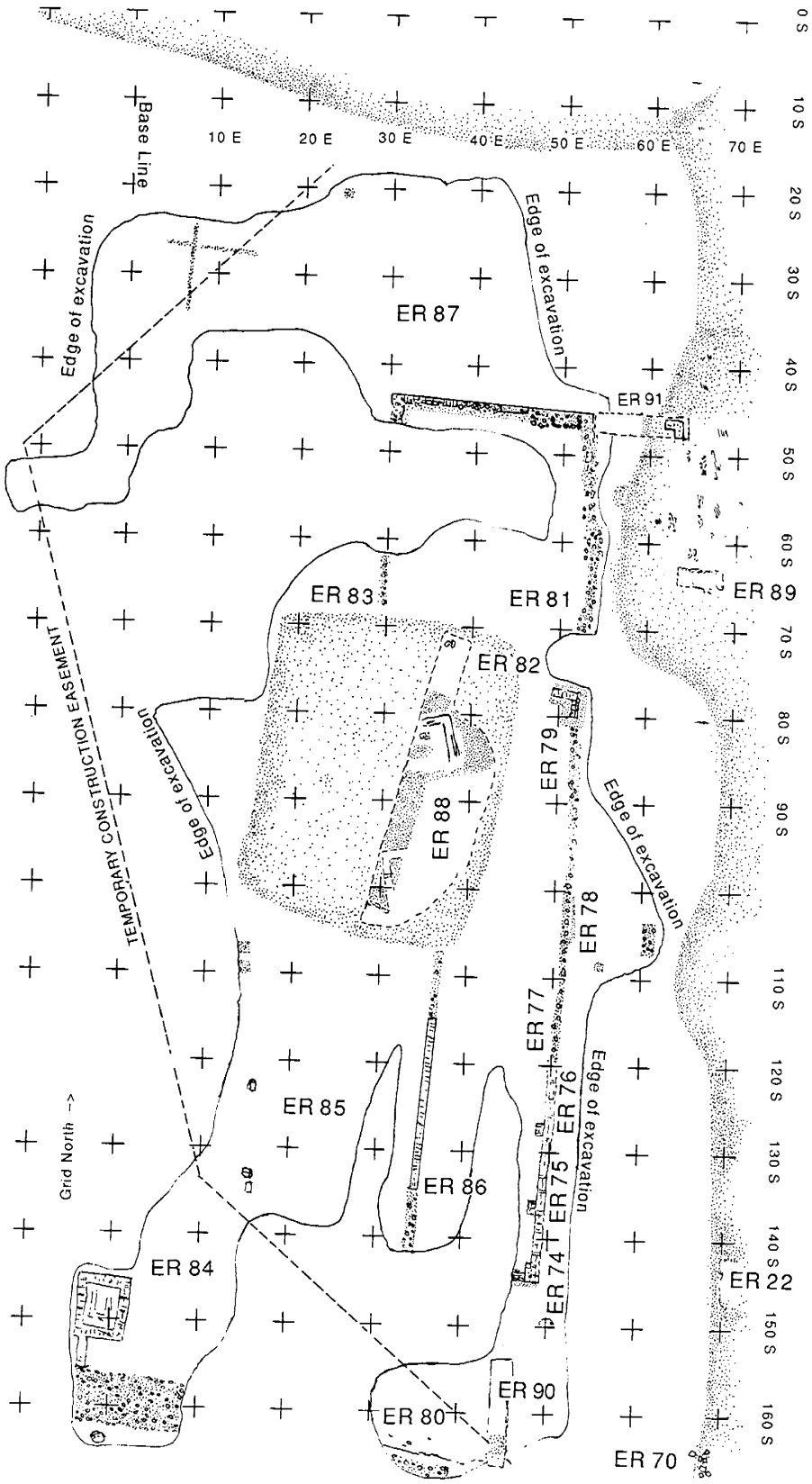


Figure 9

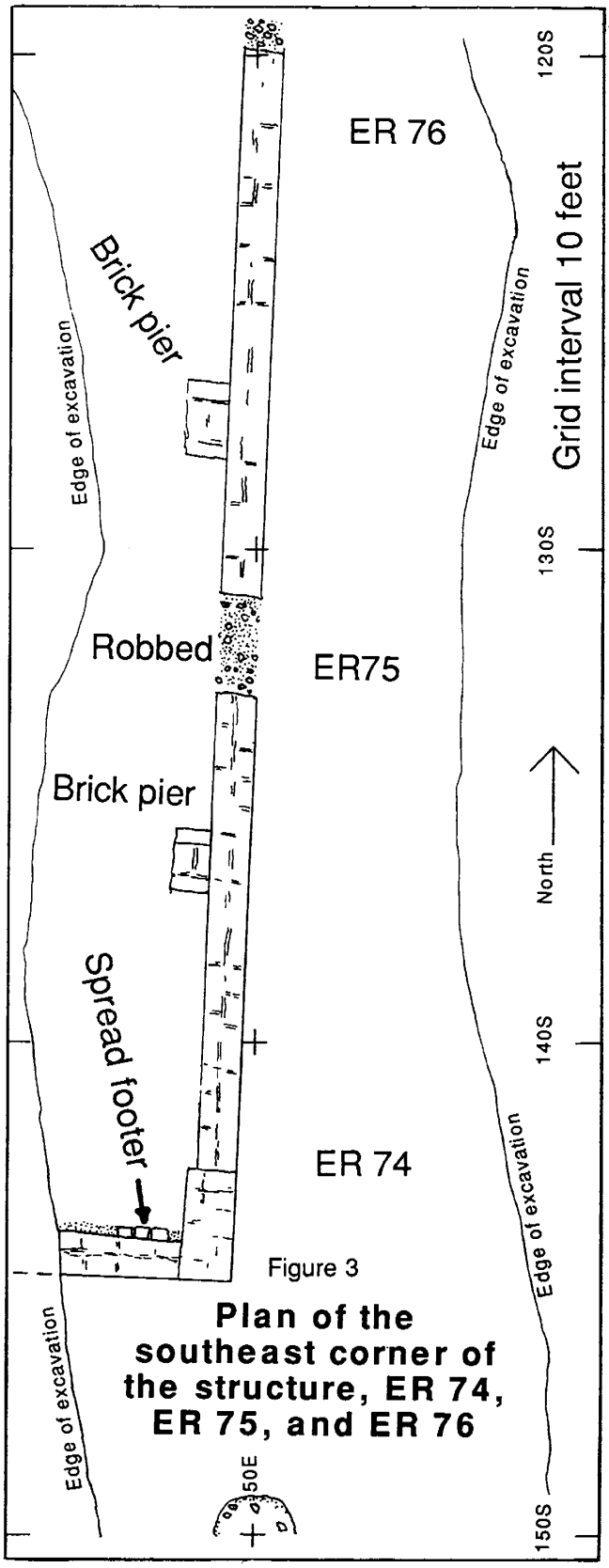


Figure 3

Plan of the southeast corner of the structure, ER 74, ER 75, and ER 76

Plate 31
The hillside before excavation, looking west across the old road.

Phase I and II testing had demonstrated that the cannery building sites had been extensively robbed, and that the lot had been subsequently cultivated. The cultivated topsoil, unlikely to contain artifacts *in situ*, could be removed by a machine, but the delicate robbed walls below would require hand excavation.

Around the edges, several large trees had toppled, leaving substantial areas of disturbance. Standing trees occupied a significant part of the site perimeter, especially along the bank. To push them down would have meant disturbing a significant area, yet their limbs would be a nuisance for the excavators. It was decided to leave the trunks and work around them, thereby avoiding the danger of disturbing the soil during tree removal.

Since the site was not deeply stratified, the two cannery periods were unlikely to be physically separated in vertical layers; we could not know how much of the first cannery had survived the first fire to be incorporated into the second. The two fires, and the subsequent cleanups, were material events large enough to leave a record over the entire site; unfortunately, the evidences of both fires could be expected to be similar, if not indistinguishable. Such indicators as brick size, mortar color, and structure dimensions were likely to be the only evidence useful in separating the two periods.

Excavated areas snaked among the trees, leaving larger trees on undisturbed islands and peninsulas of original topsoil that proved useful as control balks for the stratigraphic record.

Plate 32
View eastward across the first cut, toward the river

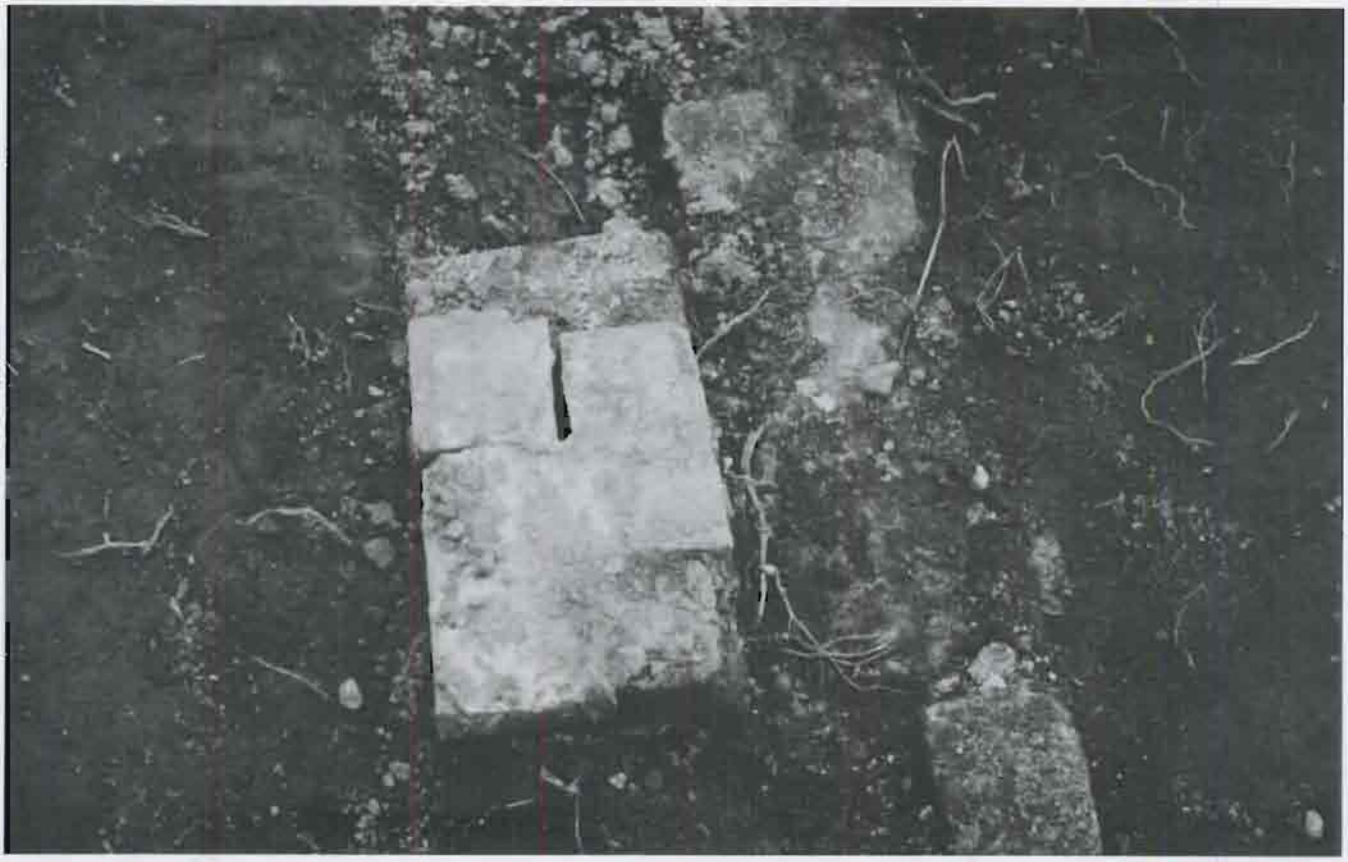


Plate 33

Brick pier found in the first backhoe cut, adjacent to the brick foundation of the east wall (right) but not bonded to it. See Figure 9 for location.

In the center of the proposed construction area was a depression, filled with brown, loamy topsoil as deep as two feet below the surface. Testing in the depression, ER 68 of the first project, had revealed the existence of a cellar, probably of a boiler room. Again, a backhoe was judged to be the only practical means for removing the overburden (FIGURE 10).

Backhoe excavation is extensive rather than intensive; on a site with no topsoil features the machine lets an archæologist view a wide area without the effort and expense of hand digging the unproductive spaces between scattered features. On most industrial sites, which consist primarily of large building foundations and isolated trash deposits, a machine is the only practical way to dig the wide area.

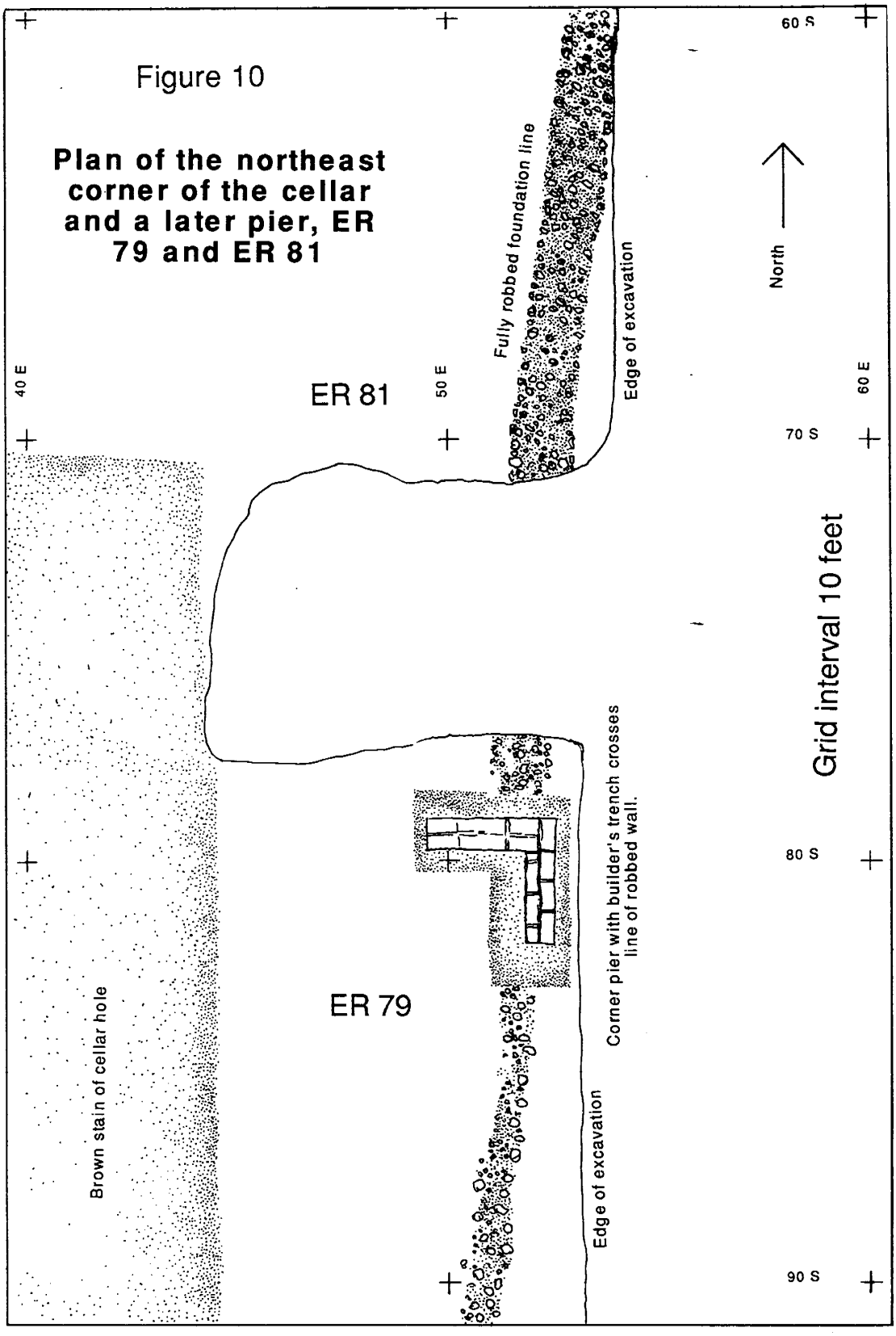


Figure 10
Plan of the northeast corner of the cellar and a later pier, ER 79 and ER 81
40 E
50 E
60 E
60 S
70 S
80 S
90 S
North
ER 81
ER 79
Fully robbed foundation line
Edge of excavation
Corner pier with builder's trench crosses line of robbed wall.
Edge of excavation
Brown stain of cellar hole
Grid interval 10 feet

Plate 34

East wall line, ER 75, looking west, with two of the brick piers in place.

Special techniques are necessary, however, if the backhoe is to substitute for the archæological shovel and trowel. Backhoe operators have been trained to dig downward, for the purpose of removing dirt; archæologists ask the backhoe to shave the surface, like a huge trowel, conforming to soil conditions rather than to construction objectives. At Lebanon, a skilled operator was able to dig the site to a level of accuracy within fractions of an inch. The order of excavation was dictated primarily by the operator's needs to provide himself working space and room to pile spoil without running across open, unrecorded, units. Excavation register entries for this work are described in terms of a swath near identified grid coordinates, rather than as neat waffle-style gridded square holes.

Vandalism was a special concern, which proved to be justified. These woods are a favorite haunt of the local pre-adolescents, whose tree fort was reduced to firewood by a state work crew. Between projects, all but one of the grid stakes had been pulled, and several large holes had been dug in emulation of archæological tests. There was ample evidence that one of the children had received a machete for Christmas. To thwart the youngsters' interference, work as scheduled so that machine digging would be performed early in the week, with the holes fully recorded by the weekend. This strategy worked

reasonably well, but stakes and foundations were destroyed twice, as the project continued on through the spring.

Excavation began with three shovel test pits along the first line to be stripped. These pits along the 50' east line (ER 71, 72, and 73), in an area outside the original test grid, revealed that the plowsoil overlay robbed brickwork, as had been expected. ER 71, at 130' south 50' east, exhibited burnt red subsoil. This was the first area opened when the machine arrived (FIGURES 8-9). The first cut ran from 160' south to 80' south along the 50' east line. As it happened, the best -preserved segment of wall fornd during the project ran along the 50' east line, and was revealed by this cut.

ER 74, along the line between 140' and 150' south, contained the remains of a brick building corner, three courses surviving in place (FIGURE 9). This was the most extensive intact brickwork that would be found on the site. The robber trench contained a copper soldering iron tip (FIGURE 26B) and an iron bail. The next segment, ER 75, from 140' to 130' east, contained more of the wall and a pier of slightly different construction. The mortar in the pier was white, while the mortar in the wall was yellow. The two structures were not bonded together; the pier appeared to predate the linear foundation. ER 76, between 130' and 120' east, also contained a pier, similar in all respects to the other one, and ten feet from it, center to center. In front (east) of this pier was a patch of severely burned soil and considerable loose tin scrap. Another patch of burned red soil was found at about 121' south, and about a foot east of the foundation. This was the last segment of the east wall with any bricks in place. The ghost wall in ER 77, between 110' south and 120' south, was robbed out; the robber trench contained considerable unburnt coal along with the mortar and chips of brick.

The next ten feet of wall, ER 78, was also robbed. At this point, there was a break in the row of trees, and the backhoe operator was able to cut a transect almost to the brow of the hill. At the edge of the flat was a robbed-out brick structure, about the size of a pier, consisting mostly of yellow mortar and small brick fragments. Immediately east of this feature was a pile of can waste that extended to the bottom of the hill. The tin scraps had evidently been lying against the brick structure when it was robbed, for the edge of the mass had slumped into the robber debris.

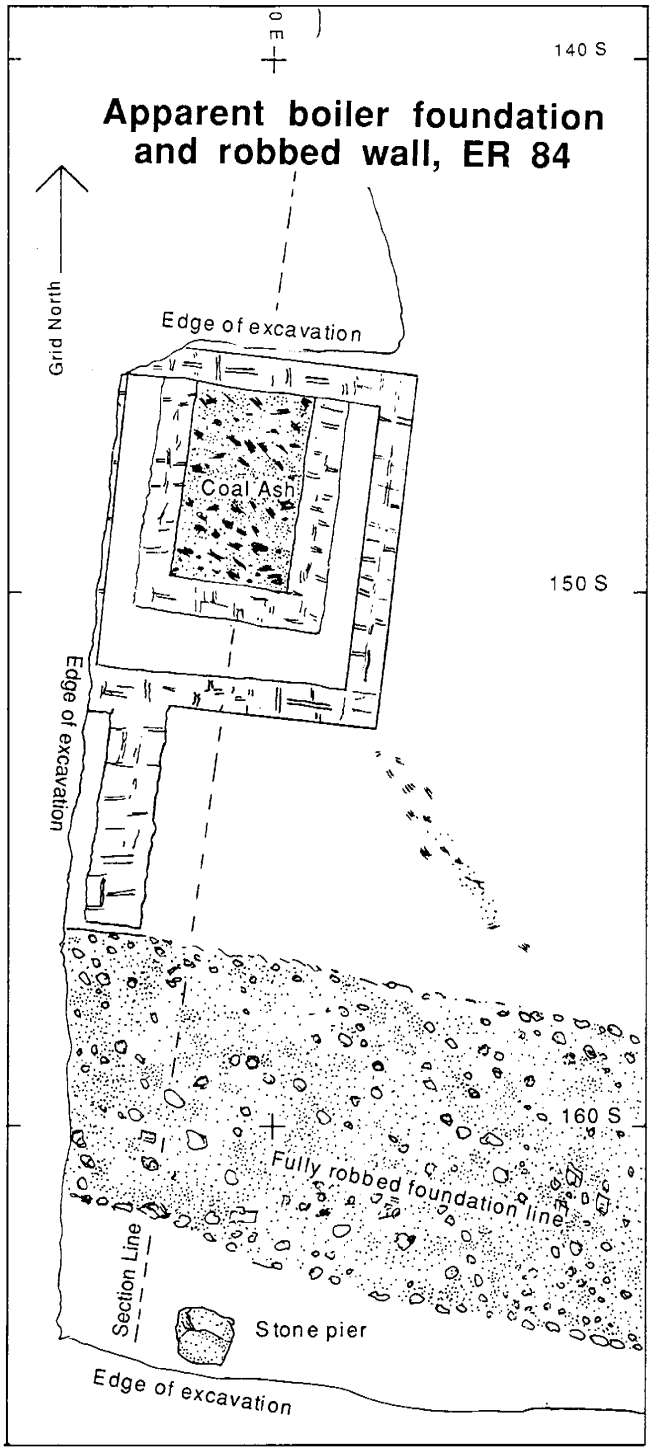
ER 79 was the rest of this swath, from 100' south to a large tree about 78' south along the 50' east line. The wall was, as before, fully robbed out. The robbed rubble was interrupted by a brick feature that was apparently newer. This feature was an L-shaped corner, three feet on a side, standing in a well-defined builder's trench (PLATE 35, FIGURE 10). This structure was on the line of the previously-exposed wall, and 65 feet north of the corner encountered in ER 74.

Plate 35

L-shaped footer in ER 79, which was built after the demolition of the brick wall

Figures 11-12

Brick boiler base



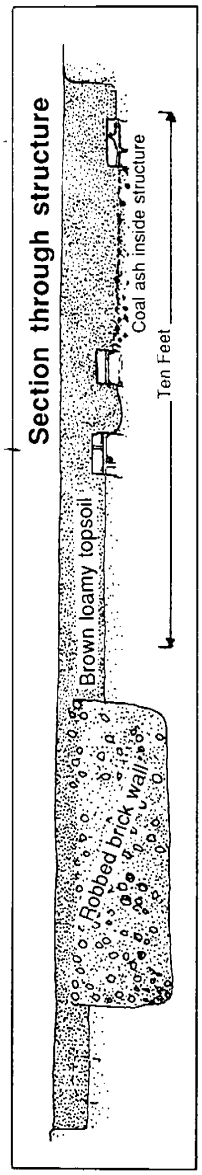


Plate 36
Boiler base at grade, west of the building, with adjacent wall to the south

In ER 80 (FIGURE 17), at the south end of the trench beyond 160' south and between 30' and 50' east, was a robbed wall that differed in several respects from the first one discovered. This robber rubble was loose, without earth admixture, and the mortar was white rather than yellow. North of the wall was a depression lined on the bottom with tin waste and filled with yellow soil mixed with brick rubble, wood charcoal, and trash. Since this feature lay on the edge of the impact area and outside the area needed for backhoe operations, it was left for the end of the project, when ER 90 was excavated in this same area.

A second session with the backhoe, January 19, uncovered a swath across the depression and out to the southwest corner of the site. The beginning of this trench, between 60' and 70' south and about 50' east, uncovered more of the robbed eastern wall. ER 82, to the west of that feature, was an expanse of featureless yellow subsoil on the north, clearly separated from the area of brown loam by a sharp, straight line. This was interpreted (correctly, it turned out) as the edge of a cellar.

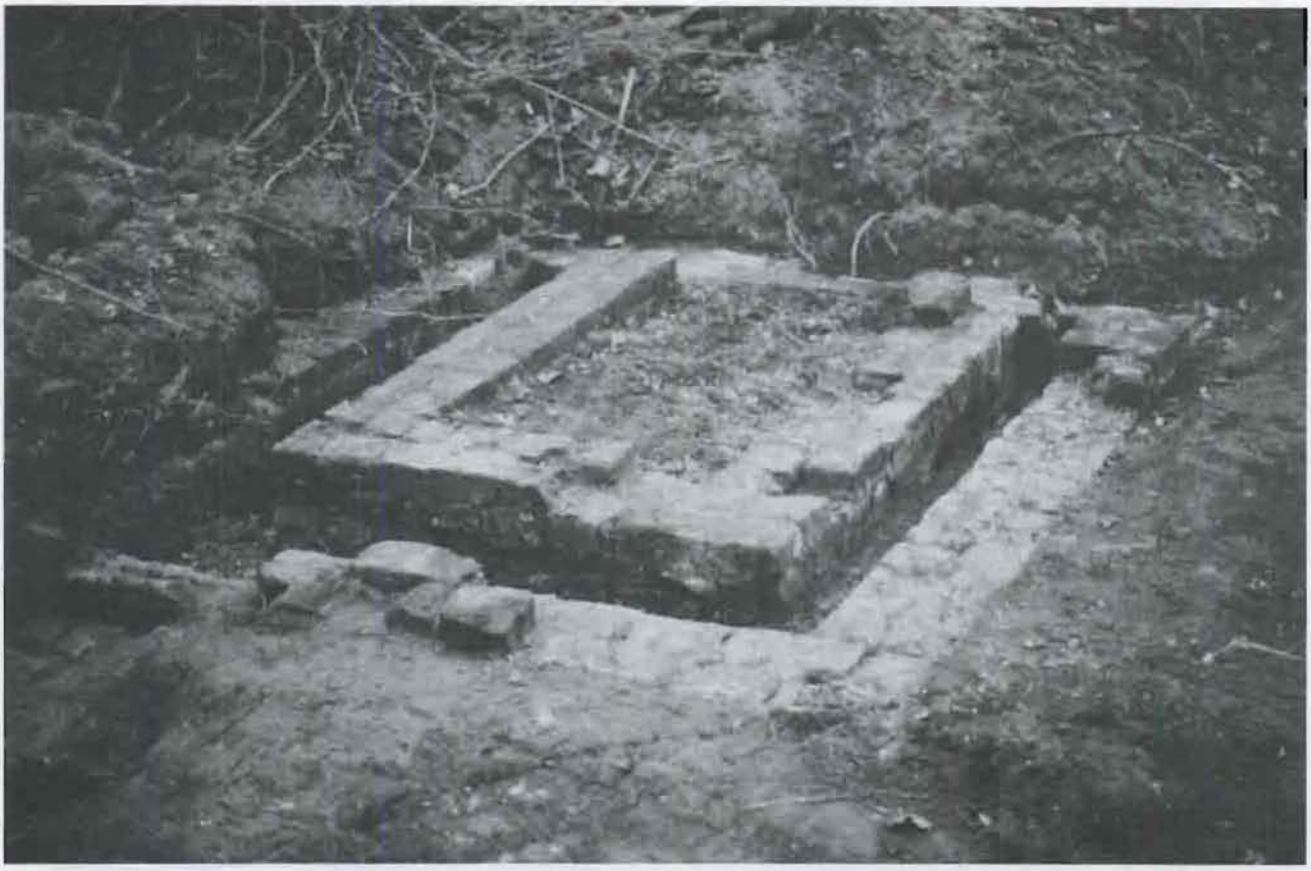


Plate 37

Close-up perspective view of the boiler base, showing the double-walled construction features. The bricks were all re-used from some other structure.

Imbedded in the brown soil was a small robbed brick feature, labelled ER 83, which appeared to be the remains of a pier built over the filled cellar. North of the cellar hole, a segment of robbed wall, less than ten feet exposed, faded away just short of reaching the cellar hole.

Near the present property line, and outside the construction area, was the largest feature discovered, consisting of three related structures (PLATES 36-37, FIGURE 11). A roughly square double-walled brick structure was undoubtedly a boiler base or firebox. It was built entirely of salvaged brick, few of which were larger than half a brick. A brick wall fragment was attached to the the south; these structures were joined with yellow mortar, but there was old white mortar adhering, indicating that the white mortar was used in an earlier phase than the yellow mortar.

Plate 38

Rubble-filled robbed wall trench immediately south of the boiler bases, as uncovered in the backhoe trenching.

Immediately south of these structures was a three-foot-wide robber trench, which had been dug after the demolition of the first structure. The fill of this trench was loose, and not mixed with soil as were most of the robber trenches on the site. The other example of this kind of fill was the trench in ER 80, which apparently is an extension of this same structure.

Beyond the robbed wall was a stone building pier, of the same micaceous "Brandywine Granite" material that is common all over the Delaware coast. Two more, similar piers, ten feet apart, would be found in the next unit, ER 85 (FIGURE 13), the space between 140' and 110' south and west of 20' east. Close examination of a point ten feet south of the southern pier revealed some stone chips, but no unequivocal evidence of a third pier in that line. These piers, combined with the brick piers on the east side, gave strong evidence that the building was erected on a system of ten-foot bays.

Plate 39
Stone building pier, one of three discovered on the west perimeter

A third backhoe session was arranged on January 30. At this time, the center of the putative building site was opened, revealing a line of header bricks, the first course of a wall. This, too, had been robbed; the surviving portion had been buried more deeply into the slope surrounding the cellar hole. Less than a foot of the second course survived where it was buried more deeply.

The backhoe came again on February 13. A cut through the cellar hole, ER 88, revealed a dense layer of robber rubble on the bottom (FIGURE 14). This cut was subsequently cleared, revealing two brick structures still in place on the cellar floor. One, on the south, was entirely outlined in robber debris, while the other had substantial brickwork surviving. These were interpreted as boiler bases, since they resembled the one in ER 84. Unlike the other example, however, these were made of new, well-made brick of the same dimenstions as the north wall foundation. The packed sand floor surrounding the structures was burnt to a ceramic-like hardness; on it lay a stratum of wood ash containing many nails, which had been cut by the robber trenches.

Caches of nails (PLATE 41) gave testimony that the site had been extensively robbed for wood as well as for brick, thus indicating that destruction was not complete. The backhoe cut intercepted the eastern edge of the cellar, marked by a robbed wall of bricks matching those in the wall in ER 86.

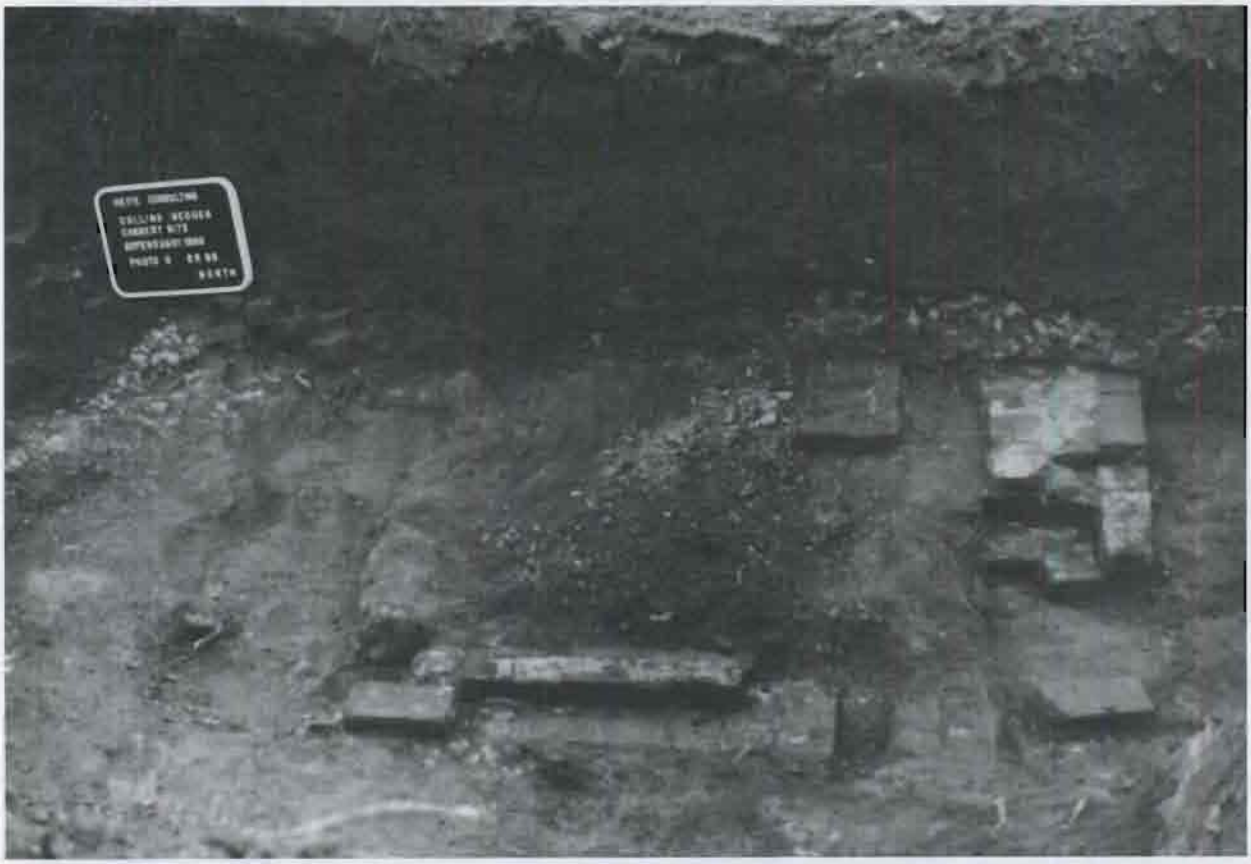


Plate 40

The northern boiler base in the cellar, looking west toward the profile line. Ash fills the center, and the foundation itself is overlain by robber rubble. Most of the fill, above, is loose brown loam. The deep test in the Phase II project penetrated at this point.

Plate 41

Cache of nails and hardware in a matrix of ash, found adjacent to the south boiler base in the basement indicating salvage work after the first fire.

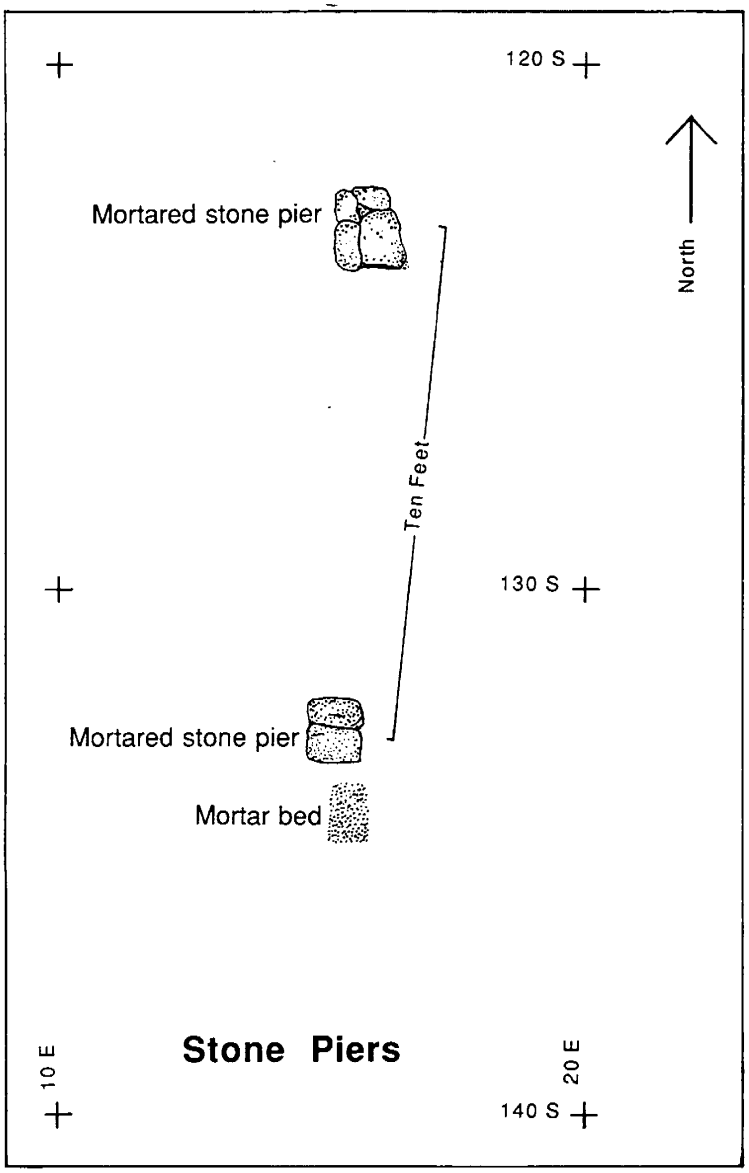
Plate 42

View eastward, showing the one-brick-thick wall found along the middle of the building footprint, ER 86.

Figure 13

Artifacts included a pipe hangar (FIGURE 26C) of the type used on steam lines and a Pamplin-style clay smoking pipe (FIGURE 26B). The earthen cellar floor was irregular, sloping up from the boiler bases.

A final area was cleared to the north of the apparent building site and designated ER 87 (FIGURE 15). A crossed pair of linear stains may be remains of sleepers; an isolated postmold is near the property boundary and may be part of a fenceline. The most significant part of this unit was a wall line, almost certainly the north wall of the same building that had been seen almost exactly a hundred feet away. It was 24 feet long, eight inches wide, with a well-defined builder's trench. The bricks match the bricks found in the cellar. At the east end of this wall, can waste overlay the wall remains. Only a short section of the east wall remained, but it contained two courses in place. Near the middle of the robbed wall, and intruding into it, was the remains of an L-shaped pier that had in turn been robbed out, and was distinguishable only because of the different texture of the rubble fill..



The lack of definitive structural remains in the cellar may be attributed to the zeal of salvagers and to the slope of the cellar hole. The thick layer of loam that seals this hole was evidently created by sheet erosion as the site was cultivated. As topsoil washed into the cellar hole, the plow bit deeper into the foundations, eventually obliterating large segments of wall. In spite of these factors, a significant amount of information was recovered.

Plate 43

Cut through the can-making waste, ER 89; see Figure 16

The final task was to uncover and explore the area of the canmaking waste around the eastern perimeter of the building. Most of the can waste was on the steamboat company lot, where it had been tipped over the side of the hill. At the northeast corner of the main building, the lip of the hill and the pile of canmaking waste came up to the edge of the main building foundation, actually lying against the robbed wall. Clearly the ten-foot side addition described in the insurance declarations could not have existed on

the top of the bluff as it now exists. The next step was to dig away some of the overburden to accurately map the extent of the can-making trash deposit and to attempt to discern what happened to the documented ten-foot wing.

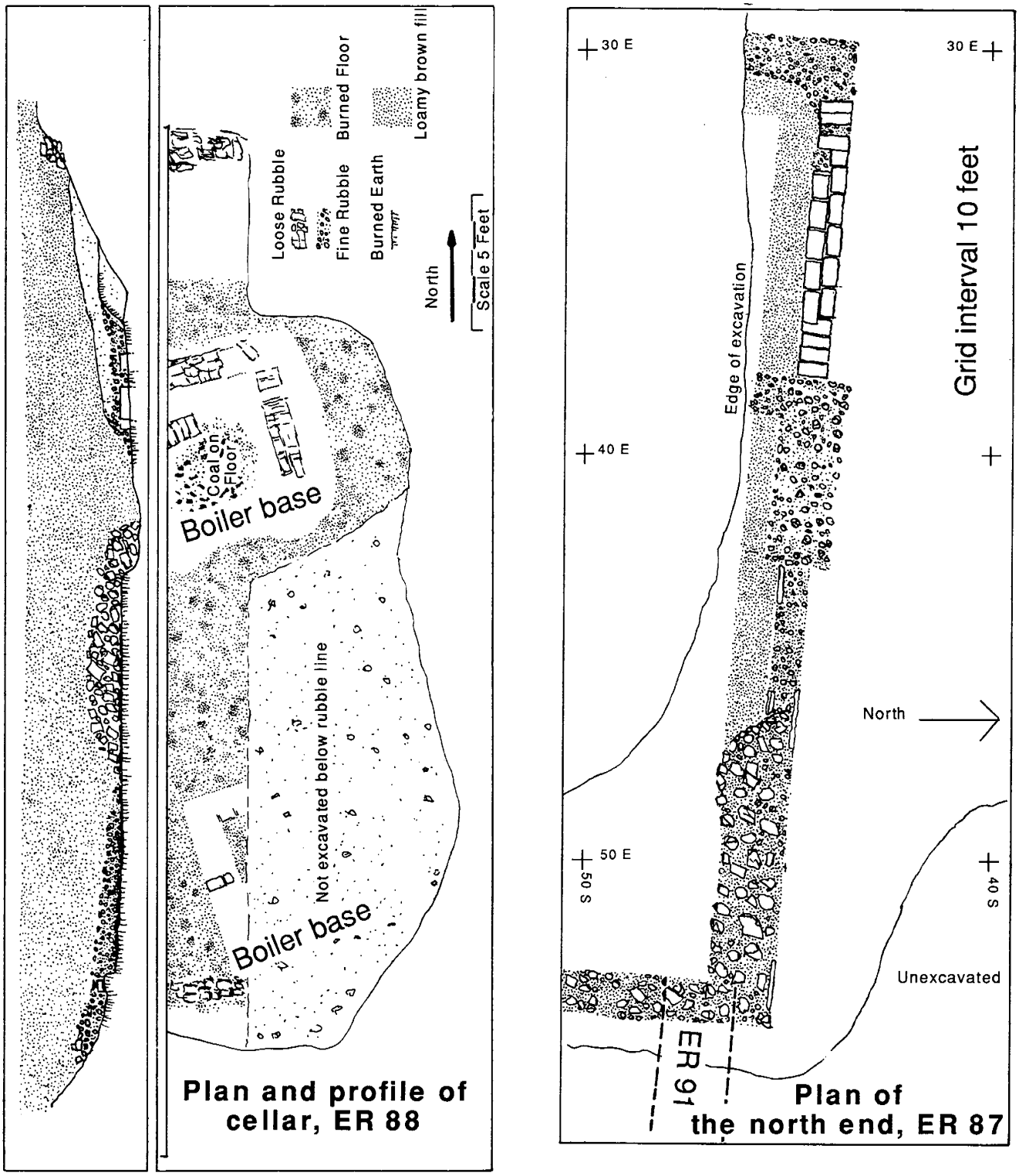
At this point, Mr. Thomas Pickering paid one of his periodic visits to the site. He related a story, handed down from his father, that can waste had been used here to fill a washout in the hill. Mr. Pickering added that can waste had been used to fill a soft place in a road on his farm as well. If tin waste was used extensively for this purpose, then the plant must have produced considerably more waste than is apparent on the surface today. Tinsmith Richard Haddick visited the site and volunteered the information that the amount of waste from tinsmithing operations will depend upon the skill of the person laying out the job, and even today may be as great as 25%.

A hand-dug test pit, ER 89, was sunk into the waste pile at what appeared to be a particularly deep point (FIGURE 16). The resulting profile revealed evidence of two construction phases. Lying on the natural subsoil was a deposit of disturbed yellow soil with some iron flecks, possibly nails, overlain by a topsoil containing coal. This in turn had been disturbed when a second layer of building debris, containing some can waste, was deposited. On top of this second deposit was a layer of can waste, which in turn was covered by topsoil. The can waste consisted of a rusted upper layer and a still-shiny lower layer. A more recent topsoil covered the deposit and continued up the hill.

At the extreme south end of the site was an area containing considerable can trash and brick rubble that had been set aside for later investigation, ER 80. When the backhoe came April 21 to backfill much of the site, the area around ER 80 was enlarged and scraped to subsoil. The expanded unit was called ER 90 (FIGURE 17). A trench was also cut at the northeast corner of the foundation and labelled ER 91 (FIGURE 18); this trenching was stopped when the machine encountered a foundation ten feet from the building corner. The machine operator went on and finished backfilling the rest of the site.

These two trenches proved to be among the most complex units on the site, and some of the most interesting.

Figure 14-15


Loose Rubble
Fine Rubble
Burned Floor
Burned Earth
Loamy brown fill
North
Scale 5 Feet
Coal on Floor
Boiler base
Not excavated below rubble line
Boiler base
Plan and profile of cellar, ER 88
30 E
30 E
40 E
Edge of excavation
Grid interval 10 feet
North
50 E
50 S
40 S
Unexcavated
ER 91
Plan of the north end, ER 87

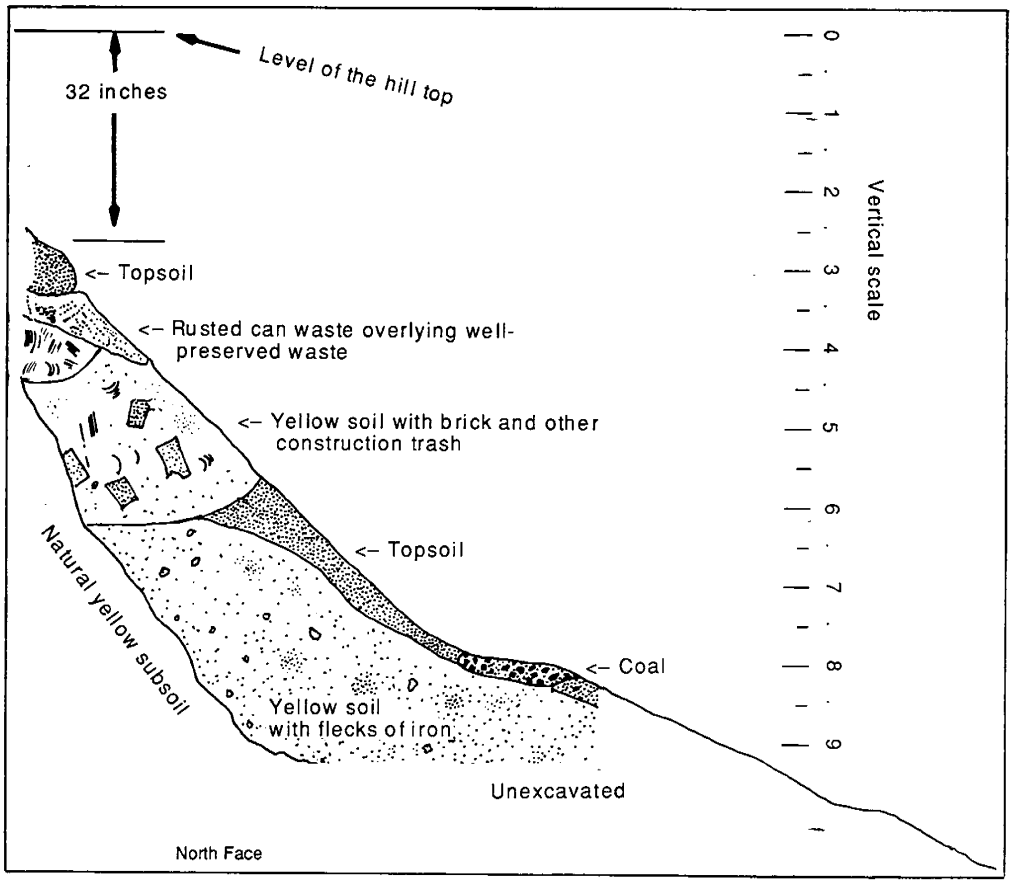


Figure 16
Profile through the dump, ER 89

ER 90, the apparent layer of can waste at the south end of the site, proved to be the slumped fill of a trench, the purpose of which is yet unclear. The second machine scraping of this area showed the end of the substantial robbed brick wall and the extent of the feature (FIGURE 17).

A trench hand-dug across the feature revealed two periods of construction, one fire, and subsequent abandonment of the feature while the cannery was still operating.

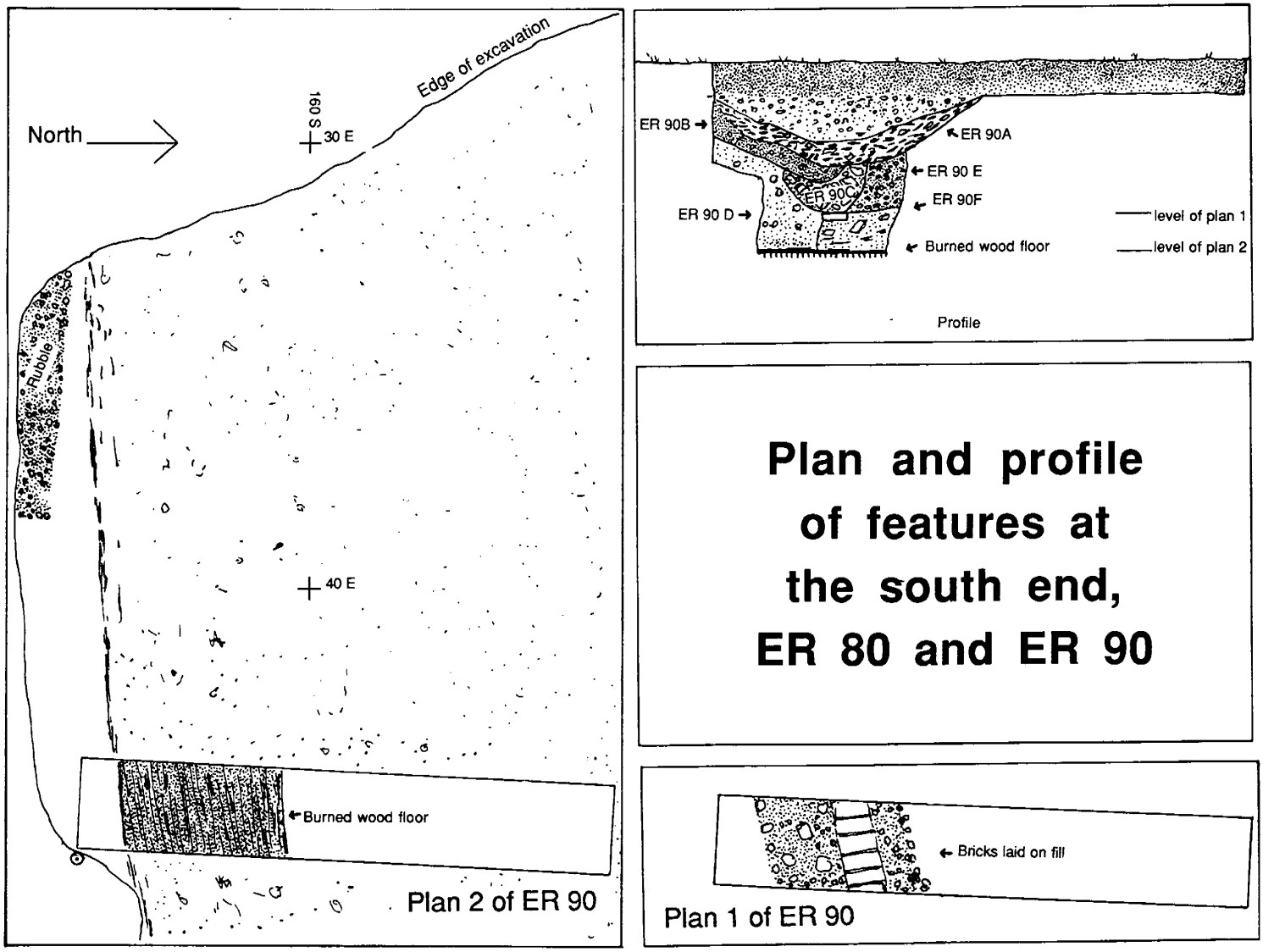


Figure 17

Immediately under the topsoil was a layer of rubbly brown earth, consisting of mortar and brick chips mixed with topsoil. When it was cleared away, a dished layer of can waste, ER 90A, was revealed. This can waste lay on a layer of mottled yellow fill, ER 90B, which gave the appearance of having been intentionally placed in the hole. ER 90C clearly was a robbed wall, consisting of mortar and brick chips in a matrix of brown earth, not unlike the material that sealed the whole deposit; at its bottom was a header course of bricks still in place, laid on fill. Under the fill was a layer of burned boards, an apparent floor.

The bottom layer of fill was laid in soon after the floor burned, for its underside had the red tint typical of burnt earth.

From its location and the evident rebuildings, this trench clearly was a part of the cannery operations. The two most likely explanations are that it was a drain or a conveyor, possibly the conveyor that connected the cannery with the wharf below.

The last trench, ER 91, was sited to solve a mystery. During excavation of the northeast corner of the main building, it was clear that the waste pile over the side of the hill was laid against the wall, leaving no room for the ten-foot side wing mentioned in the insurance policies. Moreover, the can waste actually overlay the brick footer at the supposed building corner.

A machine-dug cut (FIGURE 18) through the corner of the site revealed a brick pier, just ten feet from the wall, somewhat downhill. Behind the pier was a pocket of coal and ash, evidently waste from an active coal-burning industrial process. Above that was a layer of charcoal, as if waste from a fire. This deposit was tightly packed and full of pieces of decidedly modern plastic sheeting. Above the charcoal, apparently sealing it completely, was a stratum of clean can-making waste, over which lay more coal ash.

If this observation were correct, dating of the entire site was a century too early, and someone should remember the cannery fire. There was, however, a perfectly reasonable explanation for the "sealed" deposit of plastic sheeting.

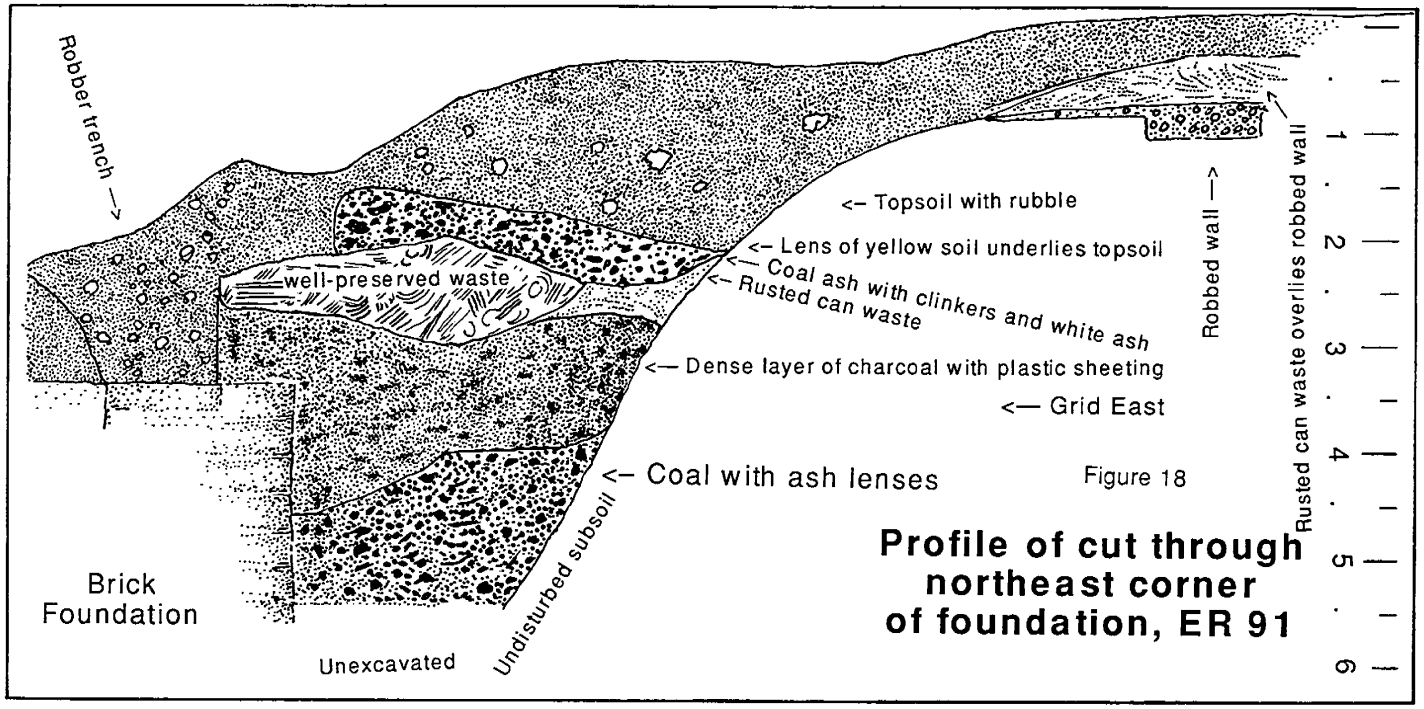


Plate 44

Ærial view of the site from the southeast, with cannery superimposed; compare plate 2, p. 4.

Undisturbed rubble-filled topsoil covered the entire deposit. It blended into a robber trench, which penetrated to the surviving top of the brick pier and defined the eastern edge of the deposits behind the pier line. Except for the plastic sheeting, the strata observed in this trench gave the impression of being the result of successive cannery-period activities. The charcoal layer, which could be interpreted as the remains of the first fire, seemed to be much newer; bits of plastic sheeting were intimately mixed with the charcoal, and sealed by the can waste.

A rodent burrow a short distance away from the trench provided the answer to the mystery. This burrow was dug through the robber layer, under the dense can layers by way of a break. Kept dry by the can waste above, generations of rodents had nested in the loose charcoal, shifting some of their plastic

sheeting away from the living area. Since the charcoal was dry, loose and homogenous, the plastic became part of the matrix, indistinguishable from the original deposit, and no burrows were apparent in the excavated trench.

During the last week in May 1989, construction of the road began. The steamboat company scale house and the modern shed were knocked down, and the hill was cut back to make way for the new curve. No unexpected historic or archæological remains were uncovered during construction of the road or the bridge; the entire project was monitored by the consultant and by DelDOT staff without results.

Plate 45

North wall of the cannery building, looking east from the corner

CHAPTER 7

INTERPRETATION

THE EXCAVATED EVIDENCE WAS SEDUCTIVELY SIMPLE. Very early in the project, the site seemingly demonstrated the truth of the insurance declaration. Bryan's reconstruction seemed to answer all the questions. We had evidence for a building twenty-four feet wide with ten-foot wings. There was plenty of evidence for rebuilding, to the point where confusing elements merely added confirmation to the straightforward interpretation of this as being the 1869-1874 Collins cannery.

Upon examination, the measurements did not exactly fit the Collins structure. There was clearly a hundred-foot building with a later seventy-foot structure superimposed over it. An older cellar, containing two boilers, predated the second structure and may have been contemporary with the first one (FIGURE 19). Moreover, the boilers were skewed to the alignment of the building foundation.

Interpolating missing features (FIGURE 20), it is easy to see the hundred-foot building, to which the cellar might have belonged. It would be easy to relate this to the first cannery, but for the fact that the last northward extension of the cannery was not 100 feet long. The extensions were 80, 86, and 50 feet long, for a total of 216 feet. The north wall of the last wing must have been near where the north wall was found, or the building would not have fit on the site.

No boiler is documented for the first cannery in the area where two boiler bases were found in the cellar, nor is there any documentary evidence for below-grade boilers in connection wth the cannery. Mixtures of construction materials, recycled building materials, and misaligned elements, further testified to several refittings of the boiler department. The distance of the coal pile from the boiler bases further confounded interpretation.

Insurance descriptions gave ample details of the first cannery, but nothing about the evaporator, which would have been larger than the one at Milford (PLATE 18, PAGE 41). A possible obvious conclusion is that the excavated hundred-foot structure is the building Collins erected for the purpose of drying fruit waste to be used in making jelly.

Figure 19

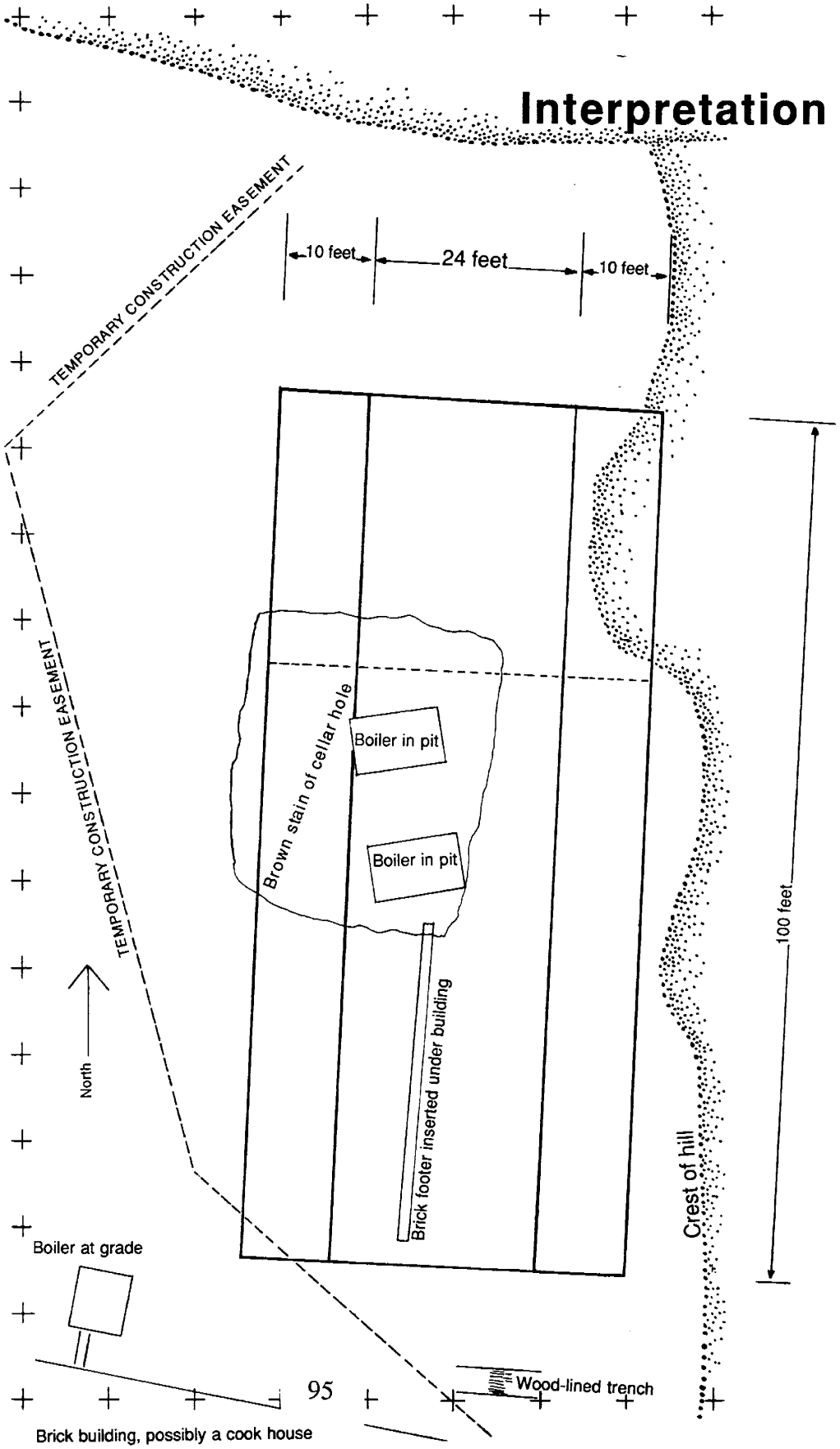
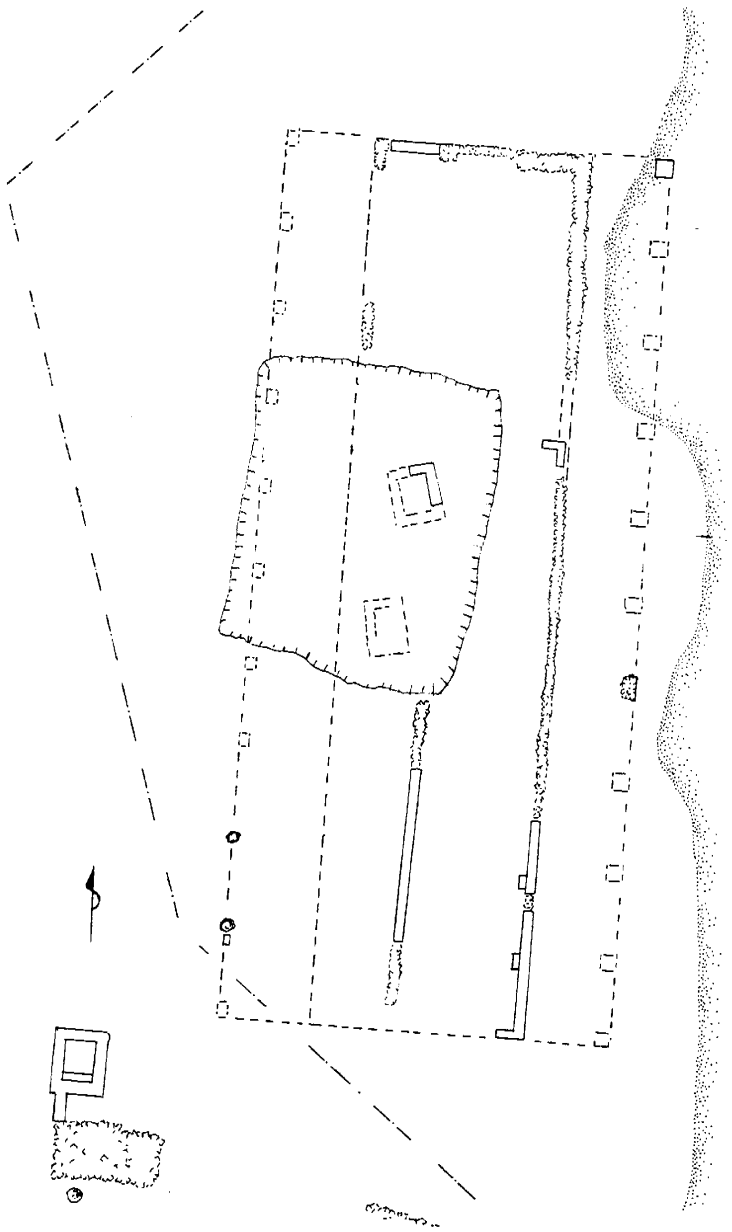

Interpretation
TEMPORARY CONSTRUCTION EASEMENT
10 feet
24 feet
10 feet
TEMPORARY CONSTRUCTION EASEMENT
Brown stain of cellar hole
Boiler in pit
Boiler in pit
Brick footer inserted under building
100 feet
Crest of hill
North
Boiler at grade
Wood-lined trench
Brick building, possibly a cook house
Location of the road in 1884

Figure 20

Archæological remains with interpolations

The solid lines represent recovered elements; the dashed lines are interpolations.



Instead of being just an incremental addition, as originally supposed, the last phase of the cannery was a complete rebuilding, finished in January 1874 when the policy (Kent County Mutual Policy 4629) was issued. The declaration describes "A two story frame can factory at Lebanon measuring 24 x 216 feet." Instead of a 50-foot increment, this expansion recorded a rebuilding, at least of the north end.

The seventy-foot later building could have been the later cannery, built over the foundations of the first one. Since a robbed-out pier on this alignment was found over the relatively loose cellar fill, the second building could not have been as substantial as the first.

Technological Evidence

Technological evidence is forthcoming from the can waste and the building's architecture, sometimes with surprising results. The active period of this cannery occurred in the middle of a transition from craft to mass production; it follows that the waste should reflect both craft practices and industrial attitudes toward work, waste, and productivity.

Mistakes cause waste, which is why many of the pieces in the current study of waste materials are mal-formed. Just as ceramic scholars have based much of their knowledge upon waster dumps, so canmaking investigators must pay attention to what went wrong, and work backward from the mistake to reconstruct the process that miscarried.

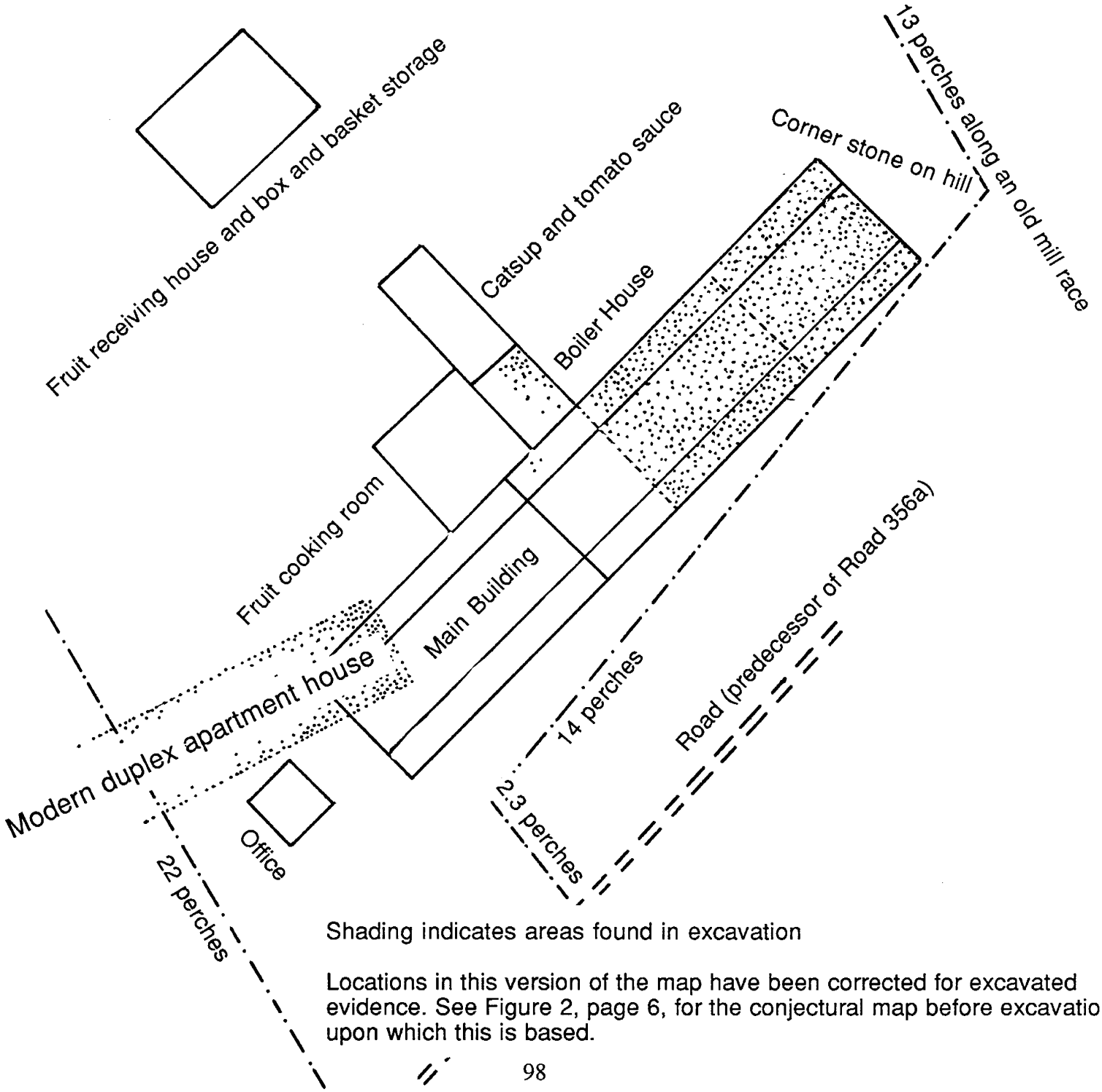
Mechanization

Mechanization is the stage between craft and industry. As an industry passes through the stages of technological development, a manual process will be mechanized until it reaches a productivity plateau where further improvements and economies are impossible or impractical. The next move forward will require introduction of wholly new technology with procedures adapted to machines instead of people; this stage is called automation. The canning industry reached the automation phase around the end of the nineteenth century, with the end of the soldered can.

During most of the nineteenth century, production was increased by streamlining a craft process, speeding up the way an old job was done, but not changing the job itself. By 1883, some can manufacturers could produce 2500 cans per hour, but the underlying technology was no different from the days when a tinker could make 5 or 6 an hour (Busch 1981:97). The 1883 cans themselves were indistinguishable from their handmade counterparts.

Figure 21

Reconstructed ground plan correlated with archæological evidence



Shading indicates areas found in excavation

Locations in this version of the map have been corrected for excavated evidence. See Figure 2, page 6, for the conjectural map before excavation. upon which this is based.

To accomplish such increased outputs, each step had been mechanized, but any mechanized step could be replaced by a traditional tinker using traditional tools. This is classic mechanization, in which the job is broken apart and each part of the job is streamlined and made more productive, but the process itself remains unchanged.

Under the American system of manufacturing, mechanization was accompanied by specialization and standardization. Instead of creating a single perfect piece, as craftsmen strove to do, can makers worked to a standard, seeking to produce components that were merely adequate to the job. Instead of a perfect fit, they worked to acceptable tolerances. Mere adequacy, combined with speed, replaced pride of craftsmanship and patience.

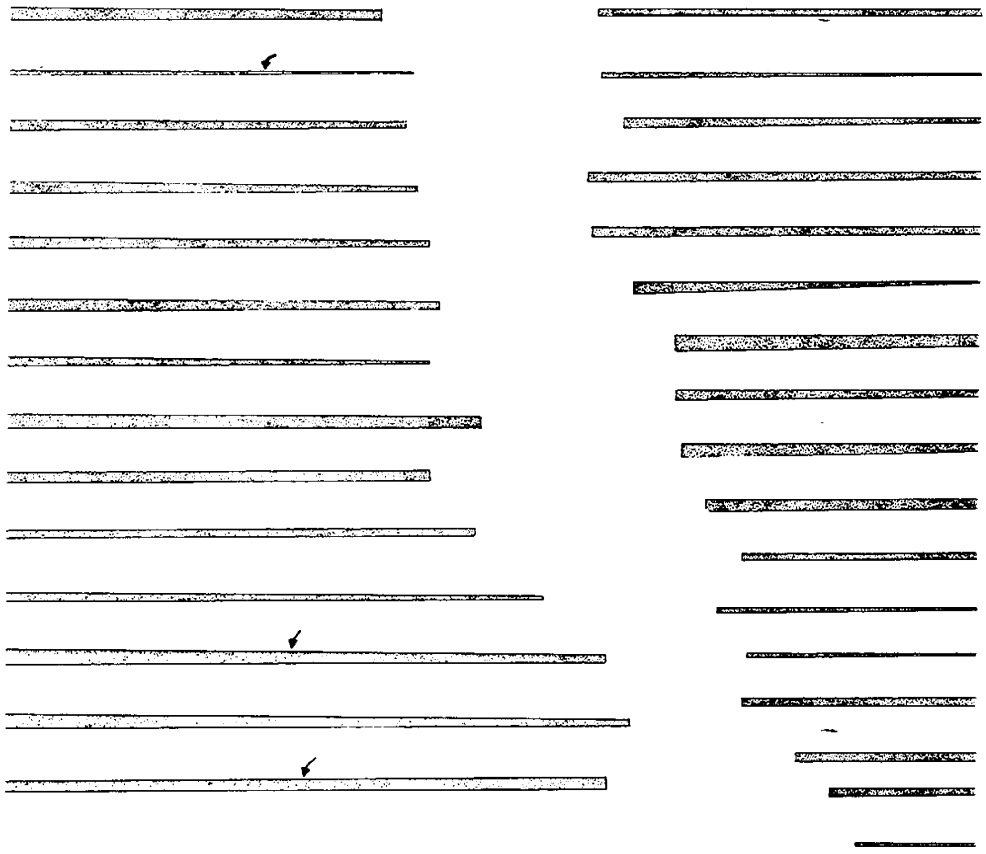
Automation brought a new element: precision and speed that no human could duplicate, and a wholly new product. Modern cans are structurally unrelated to the cans made at Lebanon, even though they are superficially similar.

Automation so completely changes the process that people and manual processes can never be re-inserted. For can manufacturers, this phase occurred very suddenly, around 1900, when the modern sanitary can was introduced. By 1910, most American canmaking was the province of a trust and the small manufacturers were gone. The sanitary can was made by a single machine from a continuous roll of metal, and joined together by crimping methods that would be impossible for a craftsman to duplicate by hand work. Within a decade, the old handmade can was virtually gone from the market, replaced by the food can we know today.

A few holdouts continued to make old-style cans. Stetson and Ellison was one holdout who bought soldered cans for at least a decade after the sanitary can was introduced. Condensed milk was still sold in a can with a turned edge and a soldered vent hole as late as 1936 (Rock 1987:43). Richardson and Robbins of Dover kept making some cans by hand until after World War II.

During the phase represented by the cannery at Lebanon, each aspect of the process was evolving separately, and each plant might include different levels of sophistication at different processes. End-making was a mature technology when the Lebanon cannery was built. As early as 1849, there were foot-powered machines to cut out the ends, and combination dies to cut and shape the ends. Pressing machines could be foot powered or engine powered, but the principle remained the same.

Figure 22



Tinplate trimmings from ER 89

Arrows indicate edges that appear to be the edge of the parent tinned plate. Not shown are 13 additional pieces that were 9 7/8 inches long.

Dimensions, First Row, inches:

Left End	Right End	Length
5/16	3/16	8 13/16
1/8	0	9 1/2
1/4	1/8	9 3/8
3/16	3/32	9 5/8
1/4	1/8	9 7/8
5/16	3/16	10 1/16
1/4	1/16	9 7/8
5/16	3/16	11
7/32	7/32	9 7/8
3/16	3/16	10 7/8
3/16	1/32	12 3/8

Dimensions, Second Row, inches:

Left End	Right End	Length
5/32	1/8	8 5/8
1/8	0	8 1/2
3/16	1/16	8 1/16
3/16	1/8	8 13/16
3/16	1/8	8 3/4
1/4	0	7 13/16
5/16	1/4	6 7/8
3/16	1/8	6 15/16
1/4	1/8	6 3/4
1/4	3/16	6 1/4
1/8	3/32	5 1/2
3/32	1/16	6 1/4
3/32	1/16	5 5/16
3/16	3/16	5 1/2

TABLE 6

CALCULATION OF "IDEAL" CAN BODY BLANK SIZES

SIZE	HEIGHT OF ENTIRE CAN (INCHES)	DIAMETER OF CAN (INCHES)	LENGTH OF SIDE COMPUTED (πD +0.5") *	CIRCUMFERENCE FROM TINSMITH'S RULE **
#1	4	2 3/4	9.13	8 5/8 + 1/2 = 9 1/8
#2	4 9/16	3 7/16	11.29	10 3/4 + 1/2 = 11 1/4
#2 1/2	4 3/4	4	13.07	12 5/8 + 1/2 = 13 1/8
#3	4 7/8	4 3/16	13.65	13 1/8 + 1/2 = 13 5/8
New Jersey #3 . 5		4 1/4	13.86	13 3/8 + 1/2 = 13 7/8
#10	7	6 1/4	20.135	19 5/8 + 1/2 = 20 1/8

* These decimal sizes are approximations, predicated upon the relatively generous half-inch side seam overlap observed in some specimens.

** A tinsmith's rule, loaned by Richard Haddick, probably is the type of measuring instrument used by the can makers, and reflects the perceptions of size and accuracy current among the people who made the cans.

End Making Technology

There were two ways to make can ends. In the first method, tops and bottoms were formed with a die that cut the blank and turned down the flange in a single operation. Fill holes in the tops were then punched and shaped in a separate operation. This was the method used at Lebanon, as shown by certain off-center lids (FIGURE 25D) and some trial pieces found among the scrap. A heavier stamping press was required for combination dies, which cut and shaped the fill hole at the same time the end was shaped (Ayars Machine Company c. 1893). Cans made with a combination die should be characterized by much greater accuracy in centering.

Many of the rejected ends suffered from incomplete flanges, the result of stamping beyond the edge of the sheet. This could have happened if the operator failed to hold the sheet firmly against the edge guide, or if the guide was adjusted too closely.

Squaring

Hot-dipped tin plates come from the mill with irregular edges, sometimes with lumps of tin adhering, even today. Squaring was an essential part of the process of making a can, as of any tinsmithing process. The process does more than simply make the sheet square; it also cuts away the irregularly-coated edges of the tinplate sheet.

TABLE 7

BLANKS AND PRODUCTS

ER	LONG SIDE	SHORT SIDE	HOLES NO.	HOLES DIA.	PRODUCT
4		8 5/8	6	3 3/4	#2 lid
			2	2	medium hole
4	12		6	3 3/4	#2 lid
			2	2 1/16	peach hole
90A	14		6	4 1/2	#3 lid
			2	2 3/8	
90A		8	2+	3 3/4	#2 lid
			1+	2 3/8	
90A		8 1/16	6	3 7/8	
			2	2 3/8	
22.12		10 1/4	2	4 1/2	#3 lid
22.12		10	2	4 1/2	#3 lid
22.12		5	2	4 1/2	#3 lid
7	14		6	4 1/2	#3 lid
			2	2	medium hole
7	12		6	3 3/4	#2 lid
			2	2	medium hole
3	12	8 3/4	6	3 3/4	#2 lid
			2	2 1/16	peach hole
3	12	8 5/8	6	3 3/4	#2 lid
			2	2	medium hole
3	12		6	3 3/4	#2 lid
			2	2 1/16	peach hole
3		8 1/2	6	3 3/4	#2 lid
			2	2	medium hole
90a	16	8	6	4	
			2	2 1/2	

Little slivers of tinplate scrap from the squaring process (FIGURE 22) were found in heaps at several places on the site. Bodies, obviously, needed to be square in order to make a tight fit, but most of the lid-making scrap was also squared, probably to ensure uniform tinplate. Except for the pieces made from scrap, the vast majority of the blanks from the end-stamping process are squared.

Known products of the cannery include New Jersey #3 and #2 tins with peach and tomato holes. It would seem that squaring-up should be done before cutting a side to size, and that there should be some relationship between the waste and the can size. It should be relatively easy to distinguish between

squaring waste and sizing waste. If the waste was produced by the squaring process, all pieces will be tapered. If the waste is the product of cutting squared can side blanks to size, then the waste will be rectangular; most of the waste is therefore from squaring, which is almost an automatic reflex to a tinsmith when he picks up a new sheet of tinplate. Most of Richard Haddick's tinsmithing scrap consists of squaring waste.

Excavated evidence can help us reconstruct the process and materials requirements for the can makers at Lebanon. The ten-inch side of a 10" by 14" sheet would be the bad edge in cold-rolled tinplate, and a 10" by 14" sheet would be just right for making #3 cans. A 14" by 20" sheet would make three New Jersey #3 bodies plus scrap like that shown in Figure 25(a) with two lids; to make an even number of cans would require another sheet, 8" by 16", from which would be cut six lids and two filler caps. This is exactly the evidence found in the waste.

Only three scraps illustrated in Figure 22 are demonstrably from the edge of a sheet of tin, indicating that the tinplate was squared after the sheets were subdivided. Ayars Machine Company advertised floor-standing, foot-powered squaring shears "For cutting bodies of cans and boxes, and for other tin work, ..." Ayars supplied the machine with 20-inch and 25-inch widths.On the same page, bench and hand shears were also offered. The squaring shears had guides on two sides and a guilloutine blade. An automated can-body cutter, illustrated in the *American Machinist* for July 14, 1883, would cut four bodies at once from a single sheet of metal, and would have left little waste when it was properly adjusted.

The guilloutine squaring shears, if used, did not supplant the bench shears at Lebanon. Several pieces of stamped scrap (FIGURES 14A, 21E) were clipped only part-way through, apparently by shears. Several other scraps exhibit short bites from shears. Since it was much easier for an unskilled worker to make accurate squaring cuts with a guilloutine, the open shears must not have been the preferred tool for mass production.

Blank Sizes

Sizes of sheet tinplate, like paper sizes and other standard raw materials, are deteremined by tradition. One of the oldest tinplate sheet standards was sixteen inches square; by the twentieth century, the standard size had become 14" by 20" inches, a "double" of the older 10" by 14" standard sheet (Heite and Heite 1989:106). In the *American Machinist* for July 14, 1883 (PLATE 9, PAGE 27) is a picture of a can-making production line that began with 14" by 20" sheets. In 1951, a former canmaker was reported to have recalled that four bodies could be cut from one of these sheets (Sim 1951). Coiled tinplate today is sold in ten-inch rolls.

By continuing to make traditional can sizes, modern manufacturers perpetuate a system of measurement that depended originally upon sheet tin sizes that are no longer relevant in a world of tinplate on rolls; such survivals remain in almost every industry long after the technological reason for them has disappeared.

Some of the blanks for can lids were 8 by 16 inches, or half the traditional 16-inch square plate size (FIGURE 24). It would be possible to get four #2 1/2 or smaller can sides out of this size of sheet. A 14" by 20" sheet would produce only three New Jersey #3 or #2 1/2 can bodies, or four #2 can bodies.

Of particular interest are fragments used to make #3 lids (TABLE 7) with surviving dimensions of 5, 10, and 14 inches. Two sides of a #3 can cut from a squared 14" by 20" (roughly $13^{1/2}$" by $19^{1/2}$") sheet would leave pieces $5^{7/8}$" by $13^{1/2}$", or $13^{5/8}$" by $3^{3/4}$", which were not observed. The #2 lid blanks listed in Table 2 appear to have been originally about 12" by $8^{5/8}$", which is roughly two can bodies of this size. A double of these sheets would measure 12" by $17^{1/4}$", or four can bodies from a sheet with leftovers measuring $3^{1/2}$" by $17^{1/4}$" and $13^{1/2}$" by $2^{1/2}$". These pieces were not found in quantity. A few blanks, like the one at the top of Figure 25, seem to be mis-cut can bodies, rather than intentional blanks.

Thus it is apparent that a sophisticated system of mass-production layout was being employed, in which a single sheet was not perceived as creating a specific number of whole cans of a certain size. Instead, blanks were squared, sized, and stockpiled in a way that would utilize virtually the whole sheet, depending upon the can part to be manufactured. This would explain why no small rectangular scraps were found

Comparing the standard sizes with the squaring-up waste illustrated in Figure 22, direct correlations are difficult to find. The most numerous size in that particular dump was $9^{7/8}$ inches, which most closely corresponds to twice the height of a New Jersey #3 can. The $9^{7/8}$ inches probably comes from a 10" by 14" sheet.

Figure 23
Scrap from ER 90a

A. End of a blank, from which two pieces, each 4 1/2" in diameter, have been punched. This is the end of a larger blank.

B. This piece of scrap has been used as the source for one filler-hole cap; it has been broken off a larger piece.This fragment was 4 13/16" on one side, which could have been a mis-cut can body.

C. In this example, a rejected bottom has been re-used to provide two caps.

D. The purpose of this wire, possibly a bail, is not known.

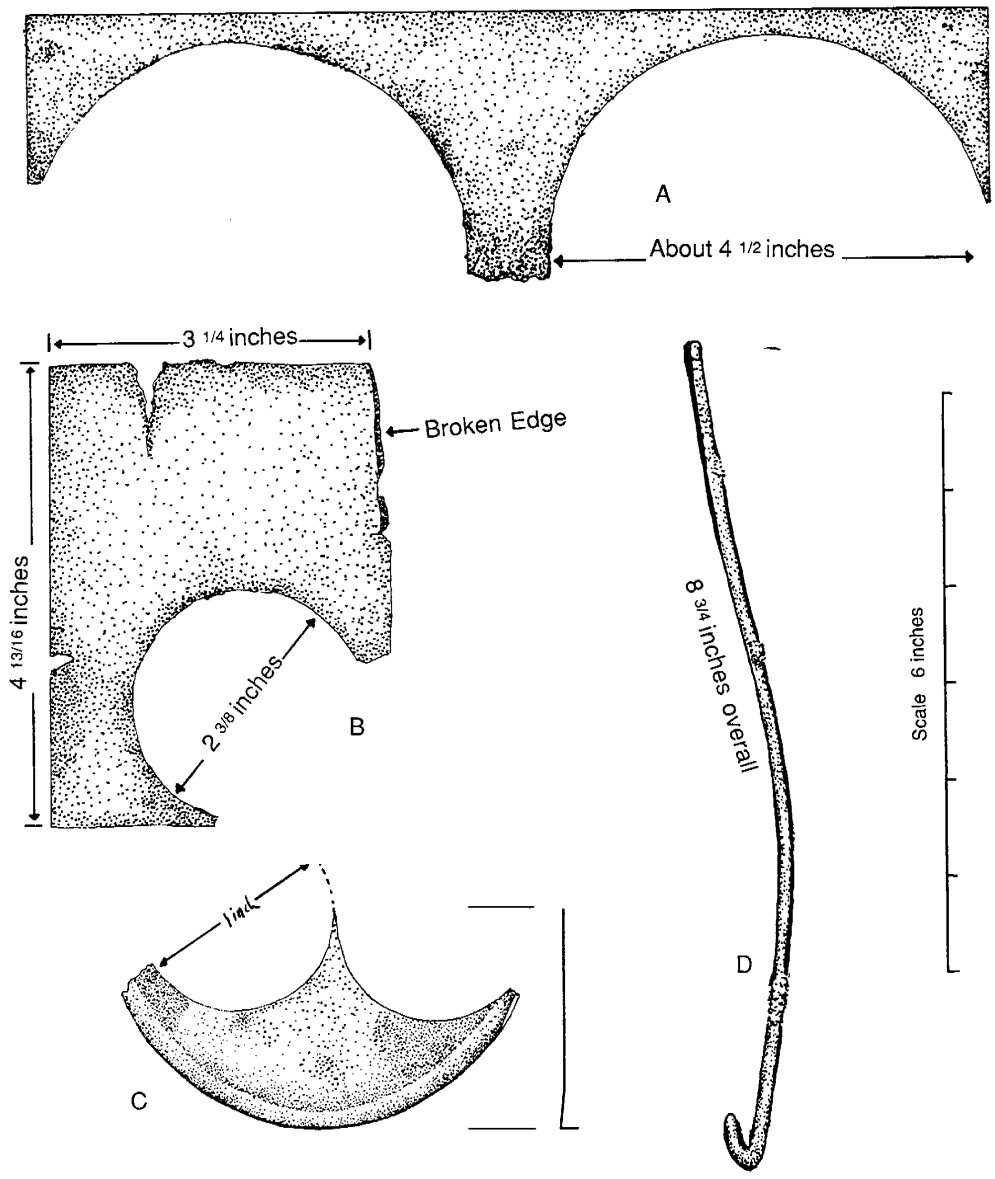


Figure 24

Typical large scrap

A. Sheet, originally 8" by 16", from which six #2 ends and (probably) two caps have been cut. The 8" dimension indicates that this sheet was not squared; the top edge could be the rough edge, avoided by the operator who stamped out a cap without using the typically close spacing foujnd on the sides of the sheet.

B. Squaring waste, 1/2" by 13 1/2", resulting from squaring a 14" by 20" sheet.

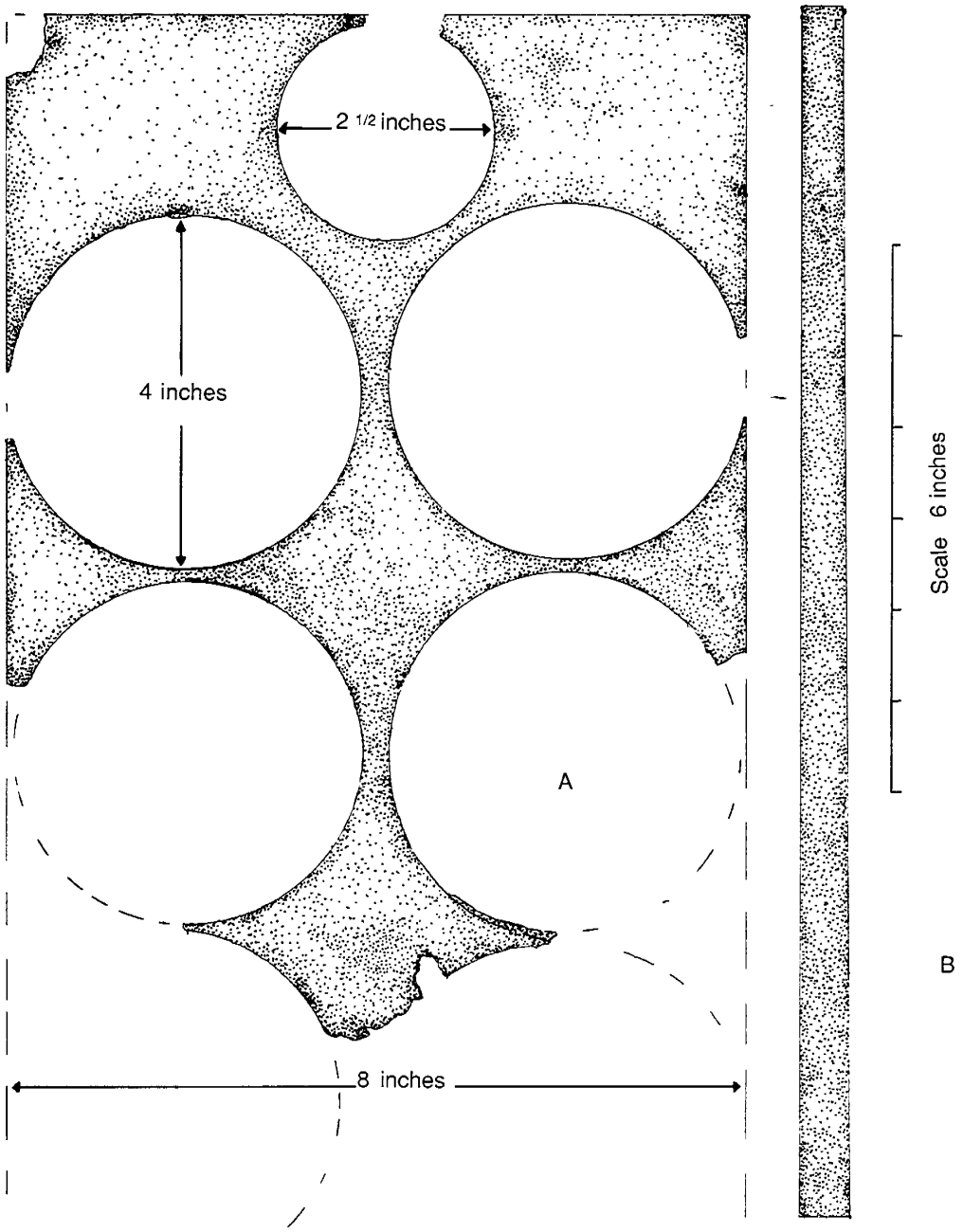


Figure 25

Scrap from ER 89

A. Odd-shaped piece of scrap from which two New Jersey #3 ends have been stamped. The piece was subsequently cut again with shears.

B. Piece of scrap from which #2 ends were stamped

C. A can end with a hole that virtually fills its entire area, possibly to provide a fill hole for fancy goods, such as asparagus, which Collins added in 1874.

D. New Jersey #3 end, with a fill hole off center, indicating that two punching processes were employed rather than a combination die. This piece has been cut in two.

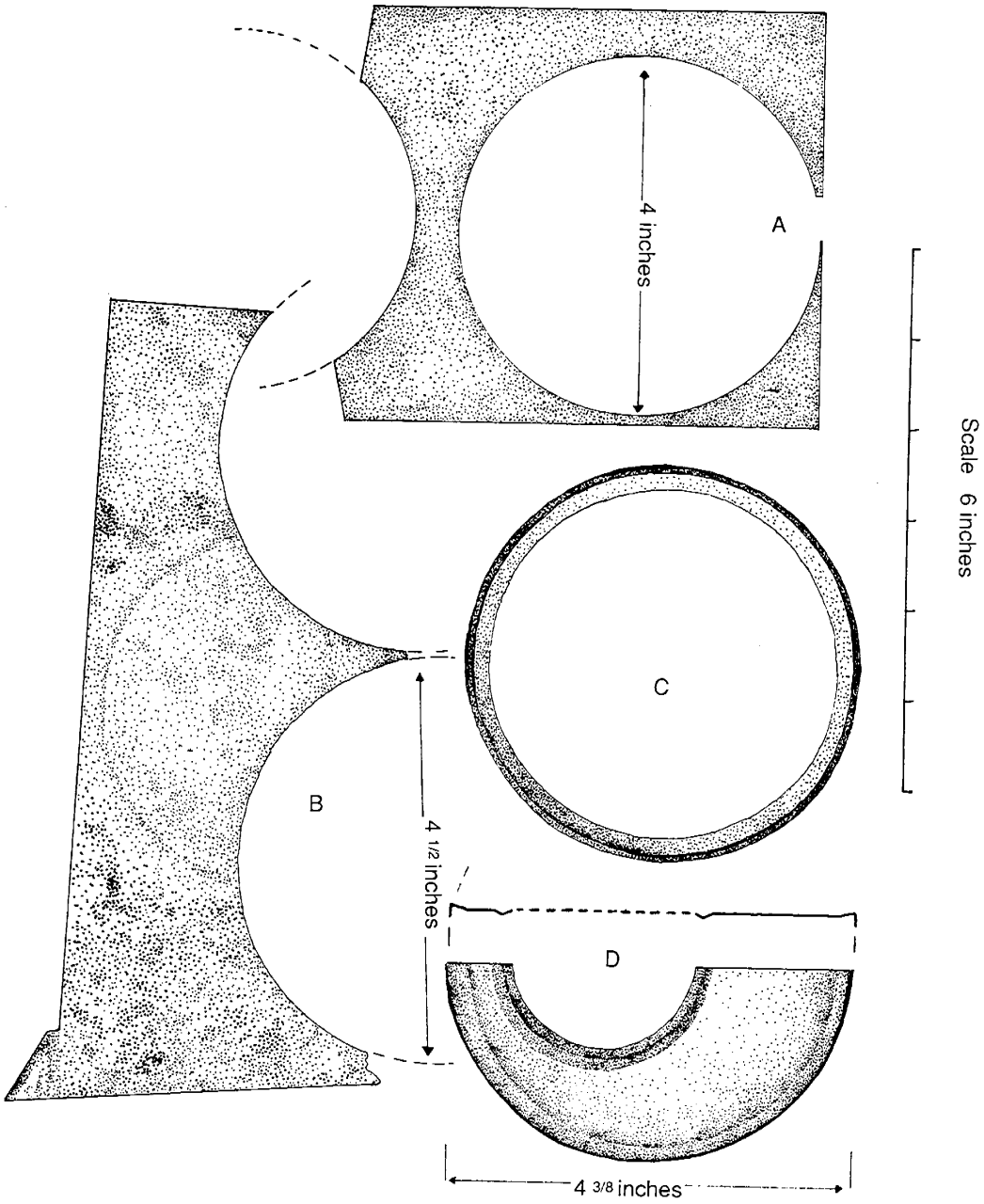


Figure 26

Tool remains

A. Piece of tile, with tool marks, apparently a soldering aid.

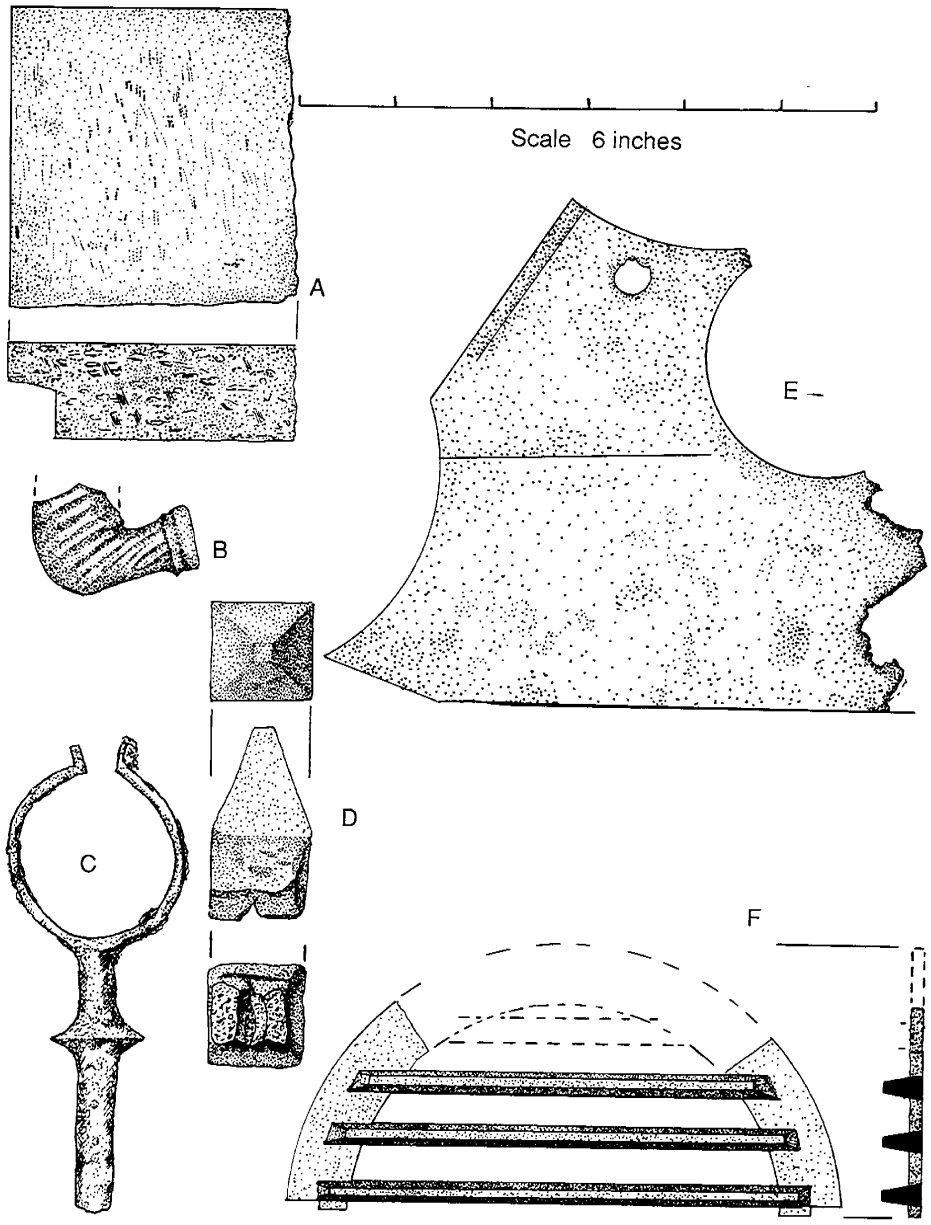
B. Fragment of a Pamplin-type clay smoking pipe, ER 88c.

C. Pipe hanger, ER 88a.

D. Three views of a soldering copper, ER74.

E. Much-mangled piece of scrap, from which three items have been punched. It was also cut with shears several times in seemingly random directions, ER 91.

F. Half of a non-ferrous grate, possibly the fire grate from a charcoal soldering tool heater of the type distributed by Ferracute, ER 91.



Almost none of the specimens in Figure 22 can be matched to one of the dimensions of a can side, unless the strip's length is roughly double the height of a can (Table 6). It would therefore appear that can sides were squared up to the double-height dimension and then split horizontally. Since there are few if any groups of identical scraps, it appears that each sheet of tinplate was shaped separately.

Tools

Precious few actual tools survived the fire and subsequent scavenging. A broken soldering iron (FIGURE 26D) is made of copper, the preferred metal. The Ayars catalogue listed three styles of soldering iron, including this one, and bar copper for those who made their own.

A pipe hanger (FIGURE 26C) found in the cellar is a relic of the steam pipes that must have run under the floor. Two parts of a grille, one illustrated (FIGURE 26F), could have been the bottom of a charcoal-fired device used to heat soldering irons. A piece of tile (FIGURE 26A) discolored by heat and covered with small nicks, evidently was a working surface. The absence of tools from the ruins may cast doubt upon the 1884 newspaper account of the second fire, which stated that the plant had been leased to a new operator and was about to resume operations.

Plate 46

This photo of the Ellendale cannery, taken in 1924, shows the lightweight construction and accretional building "plans" typical of country canneries. Like the Lebanon cannery, this example is standing on piers and is lighted by cupolas; a cupola is mentioned in an account of the first fire. In a conflagration, the cupola would have provided draft for the flames.

CHAPTER 8

CONCLUSIONS

THE CANNERY SITE has provided insights into the history and technology of canning in Delaware while that industry was growing to its eventual level of overwhelming importance in the state's economy. Some ambiguities remain concerning the actual history of the site and relative dates of various elements.

It was impossible to test the entire footprint of the factory, since a modern duplex apartment house stands on it, outside the project's impact. What was found was a foundation of two buildings 100 and 70 by 24 feet, with wings ten feet wide. The widths of the main building and of the wings were consistent with the 1870-1874 cannery, but the length does not match. The original building was 80 feet long. The first addition to the north added another 85 feet. The final extension brought the total length of 216 feet, as described in Kent County Mutual declaration 4629. This was the building that burned in December 1874.

The boiler base found west of the cannery is consistent with the second description of a boiler for the first cannery in the Kent County Mutual insurance papers; its construction of recycled bricks indicates that it was not among the earliest structures in the complex. Unfortunately, there are no declarations for the second cannery, since Collins, Paschall, and Cotter did not insure it with Kent County Mutual.

The archæological remains are consistent with reconstruction on a reduced scale, using part of the original foundations for a building only 65 or 70 feet long. Since no below-grade boilers are mentioned in the earlier policies anywhere near this location, they must be ascribed to the later structure or to the evaporator; insurance surveyors were very careful about noticing boilers. This would have been the building that burned in 1884 (FIGURE 19). The resulting factory would have been remarkably similar to a plan published by a Baltimore cannery machine builder (FIGURE 4, PAGE 28).

Abundant evidences of rebuildings added confusion to the picture. Near the southeast corner, the foundation wall has been augmented with two brick piers. About 65 feet from the southeast corner is a brick pier, obviously later than the robbed-out foundation wall, that has been inserted into the wall alignment (FIGURE 20). In the middle of the north endwall is a totally robbed configuration of rubble that seems to represent another L-shaped footer superimposed on the original plan.

Since can waste lay bedded over the northeast corner of the robbed footing, it appears that the waste was deposited after that particular structure was destroyed. The top layer of the waste, therefore, may be ascribed to the second cannery. A robber trench associated with the salvage of the northeast pier did not expose the entire pier, which remained buried under undisturbed can waste.

The rough brick wall found under the middle of the building appears to be a later attempt to shore up the second building, since it was made from bricks different from the original ones, and since it obviously was not laid out by reference to landmarks and the square of the structure. Such a footer could have been placed under the second building to accommodate heavy new equipment or to remedy a sag caused by heavy machines in the middle of such a long span over loose fill.

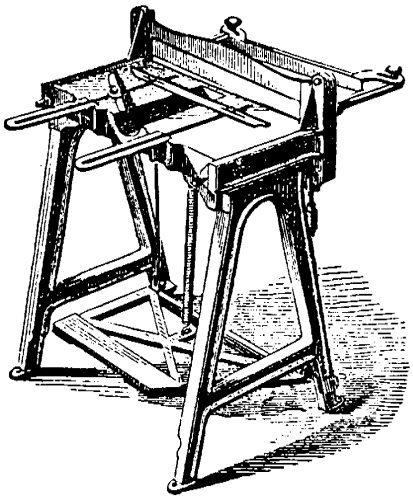
Slumping of the boiler pit and associated erosion while the site was cultivated have conspired to destroy much of the center and west of the site. We are left with a picture of a second cannery that was a shrunken enterprise, rebuilt with the proceeds of partial insurance coverage, that was no longer described in superlatives. The technology lagged behind the state of the art, most noticeably (from excavated data) in the fact that filler holes were punched separately.

Pieces of can-making presses were not recognizable in the archæological record. Only one soldering iron (or, more properly, a "copper") was found, and it was broken before burial. Heat of the fire could have been expected to ruin the precision-milled cast-iron machinery, but it was either absent or was salvaged. Over the years that followed, parts of the old cannery were hauled away. The robbed walls indicate several episodes of brick robbing.Finally the site was returned to cultivation until the duplex apartment was build on the south end of the site. Then the piece of a field in the project area was abandoned and allowed to grow up in trees.

Every cannery must have produced a large waste pile. The Lebanon cannery waste pile has fortuitously survived for study, to give us a glimpse into the working conditions and thought processes of can-makers. Tinplate trash from Lebanon reveals both thought processes and factory disciplines during a period when American industry was making the transition from craft to factory.

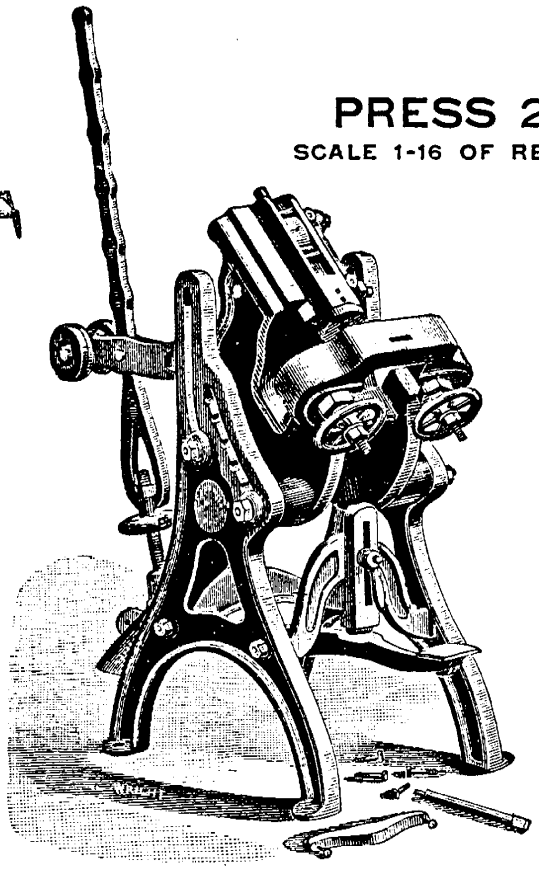
Figure 27

Illustrations from the Ferracute Machine Company catalogue

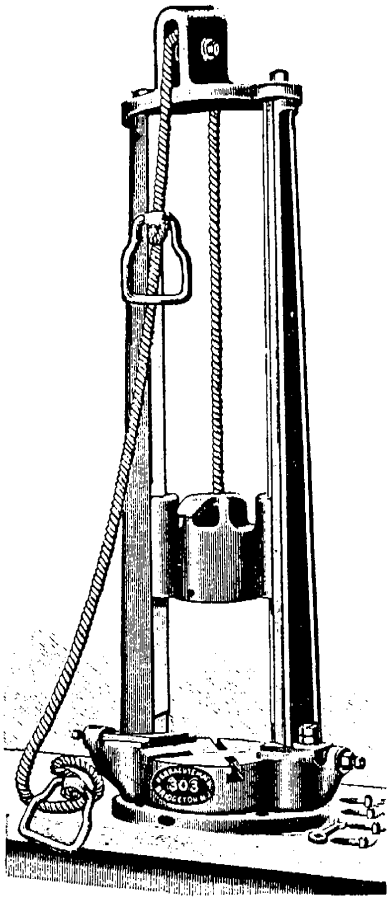


20 inch Squaring Shears.

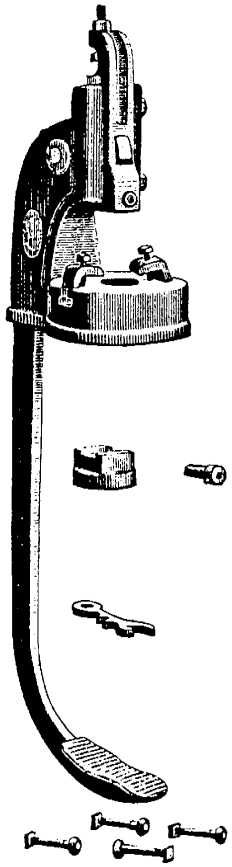
Bench and Hand Shears.



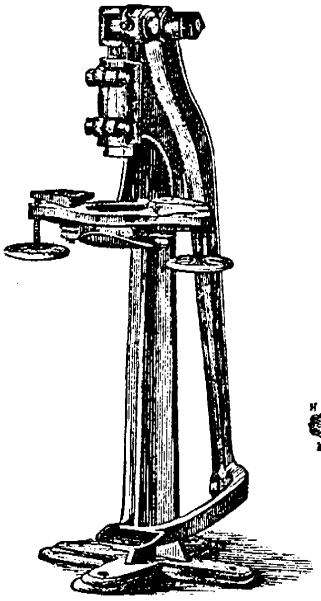
PRESS 243.
SCALE 1-16 OF REAL SIZE.



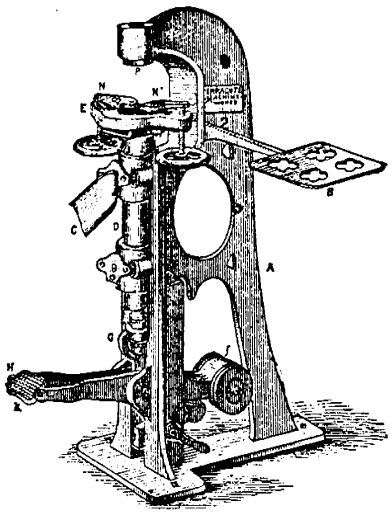
Hand Drop Press.



Pendulum Foot Press.



Pendulum Foot Press.



Bottom Slide Foot Press.

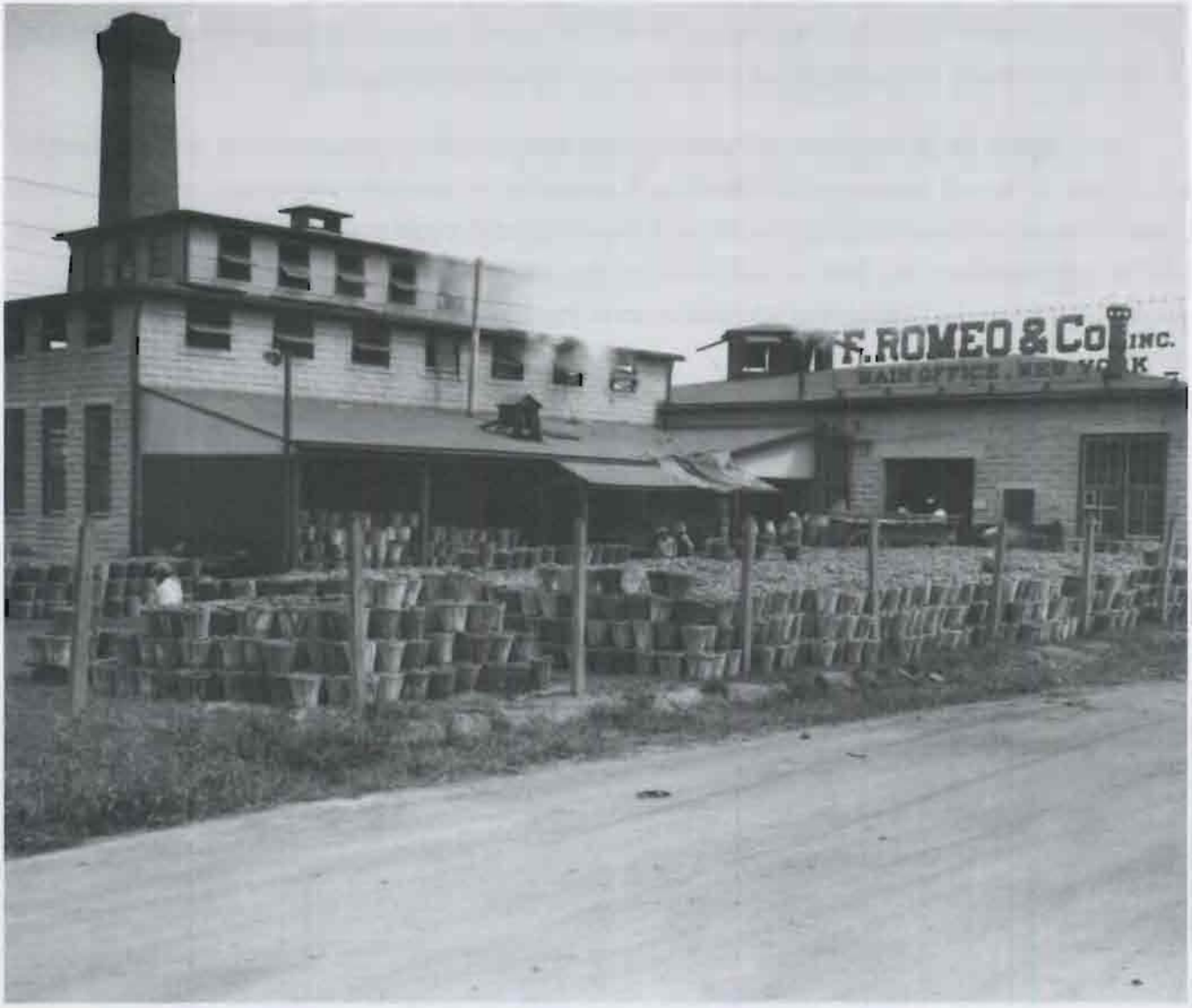


Plate 47

The all-masonry Romeo cannery in Dover reflected a change in the canning industry toward more substantial buildings owned by out-of-state combines. State Department of Agriculture glass plate negative # 82, Delaware Archives.

Throughout the nineteenth century, canners tried to improve their product and their production methods, but most cans continued to be made individually by workers in the loft over the canning factory. Americans patented many different processes and machines, which may be used as dating evidence on sites where cans have survived. Some of the innovators founded canneries that produced their peculiar cans; Richardson and Robbins' famous tapered plum pudding can was made in Dover within living

memory. By 1902, modern open-top cans had replaced most of the hole-in-top styles; these cans are made by machine in separate manufacturing plants. As the can manufacture and canning industries separated, food containers became standardized and less sensitive to archæological analysis.

As a stage in the development of American manufacturing, the Lebanon cannery provides insights into the larger history of technology. Tinsmithing is an ancient art, practiced even today by highly trained craftsmen who draw upon a long craft tradition. A master tinsmith could make the finest tin cans, but they would be too expensive and there would never be enough of them. As the canning industry began to grow, a new kind of tinsmithing was invented to meet the demand for cheap containers made quickly in quantity.

Plate 48

Scott and Daly's Dover cannery (1929-1931), shown here during off season, succeeded the Liberty Brands company in one of the last Dover plants. State Department of Agriculture glass plate negative # 1020, Delaware Archives.

CHAPTER 9

SIGNIFICANCE OF DELAWARE CANNERY SITES

CANNERIES DOMINATED DELAWARE'S ECONOMY before World War II. At the end of the twentieth century, few still stand, mostly derelect, all altered. As surviving canneries disappear, they receive scant attention from the public or from preservation planners.

Delaware historians traditionally ignore canning. No canning-related event was mentioned in Jeannette Eckman's Delaware chronology, which still is cited as a basis for preservation planning (Herman and Siders 1986: 168-181). This traditional-style historical list contains many entries for events in other industries, as well as for such landmark events in Delaware history as Aaron Burr's three-day visit to Wilmington and the death of Hezekiah Niles. It is entertaining and quaint, but as a tool for historical planning, the Eckman chronology is itself a dated intellectual artifact.

The place of manufacturing in the State Plan

Industry is not a major Delaware preservation planning focus. The manufacturing theme is the state plan's third-ranked priority for above-ground sites, and is seventh-ranked among below-ground priorities. Even at this level, the plan excludes all but one narrow local aspect of the industry theme: "*Manufacturing is included because it was the economic rationale for the development of early Wilmington and continued to play a major role there throughout the nineteenth century.*" (Ames, Callahan, Herman and Siders 1989:80) Downstate manufacturing, by implication, is not among the state's preservation priorities. Moreover, this statement demotes all manufacturing to the status of a subordinate contributor to the main theme of settlement patterns in one corner of the state.

The plan's list of priority chronological periods for below-ground resources extends no later than the "early industrialization" period of 1770-1830, which predates the beginning of downstate industrialization (Ames, Callahan, Herman and Siders 1989:81).

Æsthetic Bias in the State Preservation Plan

Æsthetic bias may have influenced the authors' decision to exclude canneries from preservation planning consideration, and to downgrade manufacturing.

Professional and amateur preservationists [those who are not industrial historians as well] traditionally favor the more picturesque industrial sites, notably water-powered grist mills. Grist mills are not nearly as significant as canneries in Delaware history, however.

Canneries in Delaware have historically outproduced grist mills, and canning has been a much larger industry than flour milling, but canneries are scarcely represented in the state's historical inventories. The only cannery on the National Register is totally gutted, preserving only the architectural finery of an atypically elegant brick building.

The 1974 Delaware Historic Preservation Plan described only this one cannery but discussed and described about twenty sites associated with grist mills. Fifteen years later, the 1989 State Historic Preservation Plan lists about the same proportion of grist mill-related sites versus canneries now on the National Register.

Even specialist industrial surveys emphasize other industries. Canning was represented in the 1974 Historic American Engineering Record survey by just two Kent County sites: Richardson and Robbins and the 1870-1956 Sheldrake cannery in Harrington; there were ten grist mills on the list. Two other canneries have recently been subjected to archæological investigation under the Delaware Department of Transportation program: those at Lebanon and Flemings Landing.

This tilt in favor of the more picturesque milling sites distorts the relative importance of the two industries. By the end of the Lebanon plant's existence, canning had grown to become Delaware's second largest industry, after shipbuilding. Scharf in 1888 listed 33 food canning and preserving establishments in Delaware, with 1044 hands, or 12% of the state's manufacturing workforce. By contrast, 81 flour and grist mills employed only 220 hands (Scharf 1888:401). During the next half-century, canning would grow considerably and milling would diminish even farther. By 1912, Delaware canned a tenth of the nation's tomatoes, 1,400,000 cases. In 1935, Delaware ranked as the second tomato canning state in the nation, with plants in thirty communities (Passmore 1978:80).

Delaware is endowed with cultural resources to correct this imbalance in the record, both above and below ground. Dover, for example, contains three former cannery buildings. Best-known is the elegant but gutted Richardson and Robbins cannery of 1881; other, less picturesque, canneries have not been so prominently mentioned. The former Romeo tomato-products cannery on North Street is now a

trucking terminal. Spence's Bazaar is a former cannery, moved from Flemings Landing and re-erected on South Street. Most of the old canning towns retain some vestiges of the industry, including a number of buildings still in use for other purposes.

Geographical bias in the State Historic Preservation Plan

Geographical bias also has worked against adequate attention to canning. Historic preservation planning in Delaware, as it relates to industry, focuses inordinate attention on the Brandywine Valley.

Viewed from the perspective of their times, the Brandywine industries had less economic value to the state and less impact on the national economy than the agricultural industries of Kent and Sussex counties. It is therefore unrealistic to include manufacturing among state preservation planning priorities merely because of its importance in Wilmington, or to regard Wilmington as the sole focus of Delaware industrial history worthy of planning consideration.

The state plan preserves and perpetuates regional bias with such statements as "Northern Delaware's watershed valleys were also the setting for major inventions and developments in the industrial revolution. In response to these broad land use trends, historical research on Delaware's place in regional economics has examined grain and animal agriculture on a statewide basis and manufacturing in the Piedmont region." This statement contains truth, but it hardly enunciates the statewide overview of economic history that it purports to promote, nor does it correctly assess the state of knowledge. The plan identifies a group of "important largely unexplored aspects of Delaware's regional economic history," consisting of "forestry, shipbuilding, highways, railroads, household manufactures, and other agricultural endeavors such as tobacco and truck farming." (Ames, Callahan, Herman and Siders 1989:91) Again, canning is not mentioned.

Although upstate technologists have made contributions, it is unfair to mention them to the exclusion of the inventors and innovators who worked in Delaware's agricultural industries. On at least four different occasions, major technological innovations from Delaware have profoundly changed the nation's diet. Yet downstate agriculture-related industries continue to fall between the cracks of preservation planning. In view of the rapid erosion of food-industry cultural resources, it is difficult to embrace a preservation planning scheme that ignores a central feature of Delaware society during the nineteenth and twentieth centuries.

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Kent County Register of Wills, Dover

Salem County Historical Society, Salem

INFORMANTS

Frank Bonsall, Rising Sun

Dr. E. D. Bryan, Dover

William Hunn, Morton, Pennsylvania

Mr. and Mrs. W. Thomas Pickering, Lebanon

Ethel Stevens, Wyoming

Samuel Thomas, Camden

Richard Haddick, Wyoming

APPENDIX 1

EXCAVATION REGISTER

(Island Field Museum Accession Number 88-228-)

ER	*Description of the unit* (*Numbers without suffix are unstratified*)	*Artifacts recovered* (*absence of a quantity assumes one*)
7 1	Shovel test pit, 130' South, 50' East, over robbed rubble at 12" below surface	Cut nail, ring-like object
7 2	Shovel test pit, 145' South, 50' East, 12" topsoil flecked with brick and shell, over brownish tan subsoil	none
7 3	Shovel test pit, 160' South, 50' East, near the pile of brick, ER 70, smooth dark topsoil flecked with brick 12" deep over yellow subsoil.	none
7 4	Machine-cut area between 150' and 140' South along the 50' East line	Soldering iron, iron bail
7 5	Machine-cut area between 140' and 130' South along the 50' East line	cut nails
7 6	Machine-cut area between 130' and 120' South along the 50' East line	Nails, can waste
7 7	Machine-cut area between 120' and 110' South along the 50' East line	Nails, can waste
7 8	Machine-cut area between 110' and 100' South along the 50' East line	Blue shell-edged pearlware
7 8 a	Robbed masonry structure east of the east wall	Canmaking waste, nails
7 9	Machine-cut area between 90' and 80' South and mostly east of the 50' East line	
8 0	Machine-cut area south of 160' South and between 30' and 40' East	Canmaking waste, glass bottle fragment, brass fitting
8 1	Machine-cut area between 80' and 60' South along, and mostly east of, the 50' East line	
8 2	Machine-cut area between 80' and 60' South along, and west of, the 50' East line	
8 3	Area of robbed brickwork in the brown fill of the cellar hole	
8 4	Machine-cut area between 140' and 160' South along the 10' East line, containing structure remains of a firebox or boiler base	Window glass
8 5	Machine-cut area between 140' and 110' South along the 20' and 10' East lines, containing two stone piers and evidence of a third one on 10' centers	

ER	*Description of the unit*	*Artifacts recovered*
86	Central cleared area, containing the remains of a wall	Bricks recovered from the single course surviving of the wall, all with white mortar adhering. All the bricks were dry-mud extruded, and many were distorted. *width* / *depth* / *length* 4.2 / 2 / 8.3 3.7 / 2.1 / 8 3.8 / 2.2 / 8.1 4.2 / 2.3 / 8.3 3.6 / 2.1 / 8.3 3.8 / 2.2 / 7.9 3.9 / 2.3 / 8
87	Cleared area at extreme north end of the project area, containing the north end of the structure	Bent strap iron object and glass found at the northwest corner of the wall. The bricks were uniform and well-made in a metal mold but not machine made. Measurable brick fragments: *width* / *depth* / *length* 2 / 4.3 / 8.5 2 / / 8.3 glazed end 2.1 / 3.8 2.2 / 4.1 2.2 / 4.1 2.1 / 4.2
88	Test through the cellar hole.	Brick rubble and whole bricks with white mortar adhering. Measurable brick fragments: *width* / *depth* / *length* 3.8 / 2 / 7.9 4 / 2 / 8.3 3.9 / 2 3.8 / 2 / 8.2 4.1 / 2 / 8.2 4.1 / 2.1 / 8.3 4 / 1.9 / 8.1
88a	Rubble layer of the cellar hole at the south end of the test	A piece of the micaceous foundation stone was found in the rubble with brick impressions on its adhering mortar. Can waste, pipe hangar, nails, staples, unidentified iron
88b	Rubble layer of the cellar hole at the north end of the test	Machine-made wood screws, pieces of sheet metal, cut nails, piece of a tool
88c	Cache of nails, sheet metal, and a smoking pipe at the bottom of the cellar hole	Cut nails, sheet of metal, Pamplin-style pipe
89	Large trash pile in the gully near the northeast corner of the structure remains. This was tested with a hand-dug trench.	Much shiny tin waste, including many long, narrow trimmings and open lids
90	A backhoe trench through a feature near the Temporary Construction Easment. This proved to be a ditch-like feature with a wooden floor, which had been burned. The soil immediately on top of the wooden floor was scorched. A layer of laid bricks was found above the floor.	
90a	A lens of can-making waste	Scraps from lid stamping, wide strips of tin
90b	Fill over rubble	Blob of melted glass that had formed around a cap, rimsherd of blue shell-edged pearlware, hand-painted white earthenware, waste from cap making

ER	*Description of the unit*	*Artifacts recovered*
90c	Rubble of a demolished wall in a trench	Mould made bricks, white mortar adhering *width* *depth* *length* 3.8 2.1 8.3 4.3 2.1 8.6 4.2 2.1 8.4 4 2.2 8 glazed 4.2 2.1 4 2.2 4.1 2.2 7.8 4.1 2.2 8.2 4.2 2.1 8.8 4 2.2 8.2
90d	Brown earth below the top of the rubble, down to the top of the burned wood. The bottom few inches of this fill was scorched, as if it had been put in right after the wood burned.	
90e	Burned wood floor and associated materials	peach-size cap, fragments of caps
90f	Fill below the laid wall and above the burned wood floor	Piece of heavy sheet metal about 5 by 14 inches Piece of tinplate scrap with the remains of a joint Misshapen brick, 2.2 by 3.6 by 8.3
91	A backhoe trench from the northeast corner of the structure to the brick pier ten feet away, downhill, with deep fills that were not differentiated in collecting	Strips of can waste, catsup bottle neck, stone fragment, parts of two semicircular grates, piece of sheared scrap metal, nails, solder

APPENDIX 2

SOIL CHEMISTRY

CHEMICAL RESIDUES from the canning process should be useful indicators of activity areas within a cannery site. Metals, fluxes, and food wastes should leave their signatures in the chemistry of the soils overlying the site. Since only a small part of the site was being studied, it was not possible to conduct a complete chemical survey of the cannery as it existed during the fifteen years of its active life, 1869-1884. Nonetheless, six soil samples were taken and analysed by the University of Delaware soils laboratory. Their locations are shown on a site map, figure 28, page 126.

Locations of the chemical samples were chosen to provide a diversity of conditions. Results proved to be equally diverse. Calcium, which could not be graphed on the pie charts because of its overwhelming predominance, varied widely. Zinc, as expected, was most concentrated near the can-making waste, as was phosphorous.

Such diversity certainly points to the future usefulness of chemical mapping as a technique for isolating areas in future cannery or related industrial sites. For purposes of the present study, it remains a path not yet chosen.

TABLE 8

SOIL SAMPLES FROM SIX SELECTED LOCI AT THE LEBANON CANNERY (FIGURE 28)
(POUNDS PER ACRE)

	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6
PHOSPHOROUS.	35	5	241	51	1	6
POTASSIUM.....	95	95	297	92	231	131
MAGNESIUM....	140	58	322	106	518	71
MANGANESE ...	24.1	23.9	31.8	50.1	28	18.1
ZINC.....	8.8	5	45	7.7	13.1	3.6
CALCIUM	1193	409	3560	819	11214	623

Figure 28

Site plan, with locations of chemical tests

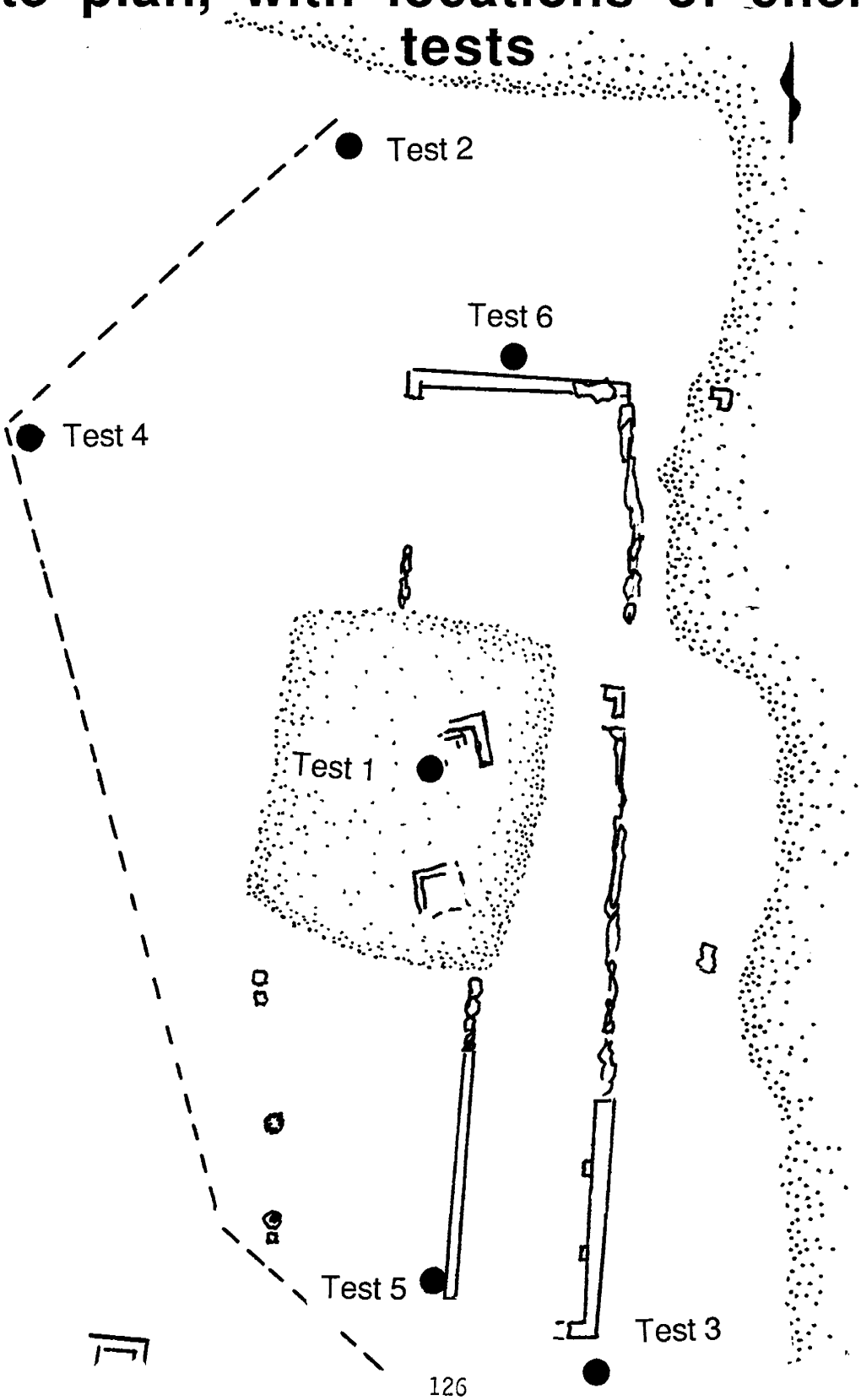
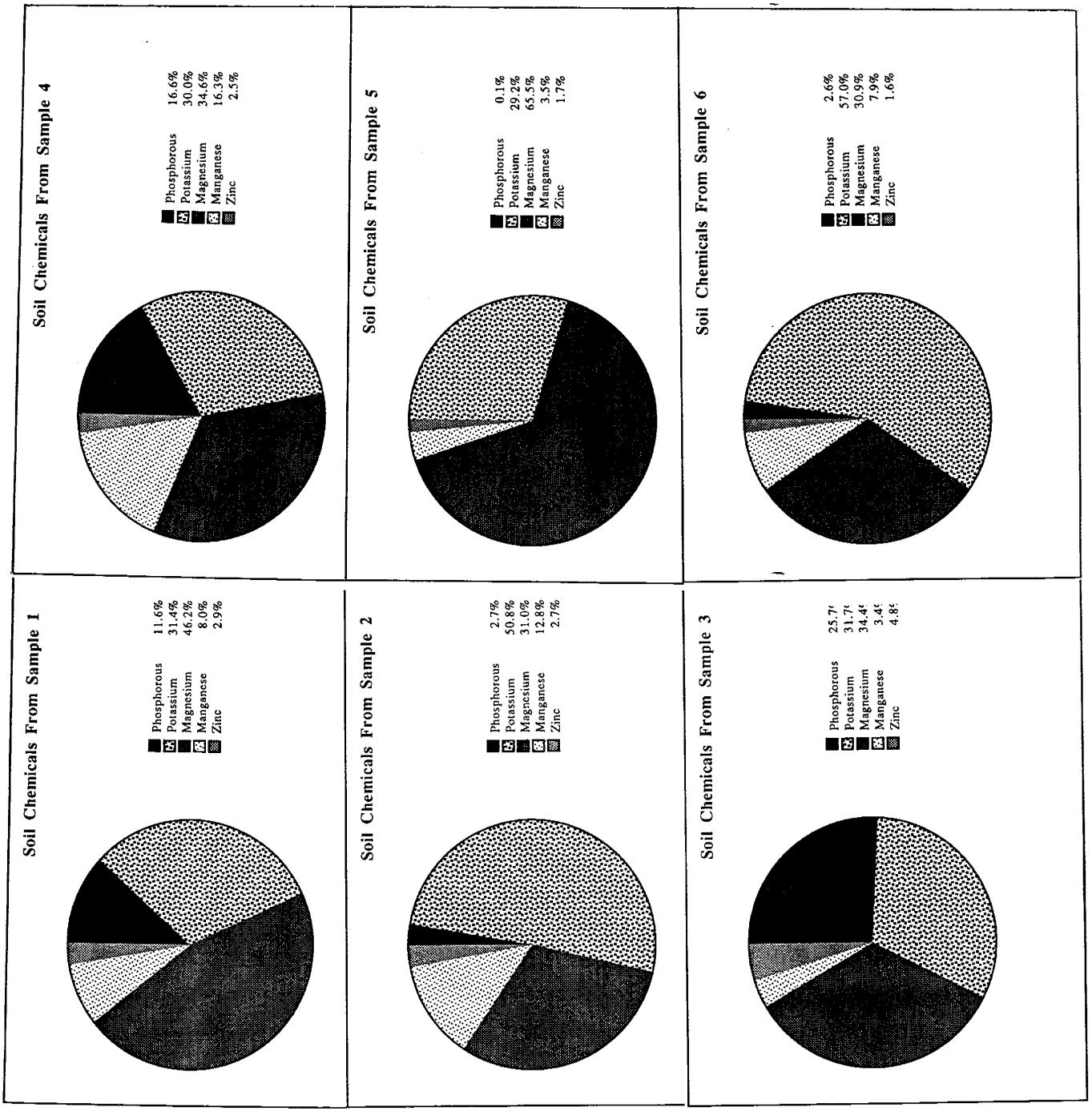


Figure 29

Pie charts of chemical test results from Lebanon cannery site



APPENDIX 3

DETERMINATION OF ELIGIBILITY

THE CANNERY SITE WAS DETERMINED by the State Historic Preservation Officer to be elibible for listing in the National Register of Historic Places. The following is a summary of the contents of the National Register of Historic Places registration form that was filed in connection with the action:

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

1. Name of Property	
historic name	Collins, Geddes and Company Cannery Site
other names/site number	K-522, 7K-C-14 (archæological site) K-3265 (duplex apartment)
2. Location	West of County Road 356a and North of Road 26
city, town	Unincorporated village of Lebanon Delaware Kent County
3. Classification	
Ownership of Property	Category of Property
public-State	site

7. Description

Describe present and historic physical apearance.

The Collins, Geddes and Company cannery site is located northwest of the intersection of County Road 356a and County Road 26, on a low bluff that rises about 20 feet above the valley of St. Jones River. The site consists of three parts. On the south is a duplex apartment house and its associated lawn and outbuilding; approximately one-half of the house and lot are within the historic boundaries of the site. The northern part of the site consists of an overgrown field, bounded on the north by a gravel pit, on the wst by cultivated farmland, and on the east by the bluff. The third element of the site's present configuration consists of a steep bluff separating the cannery site from the road below; this bluff is the cannery waste dump site.

Between 1869 and 1884, the level ground at the top of the bluff, approximately two acres, was occupied by a cannery. The slope to the east was used as a dump for discarded wastes from the can-making process. The cannery building, in its largest configuration, was a two-story frame building, parallel to the bluff and near its edge, 216 feet long and 44 feet wide, including its shed wings. Adjacent to the main building was a fruit cooking room 32 feet square; a catsup-making shed 40 by 18 feet, and a boiler house. Nearby stood two boarding houses for employees, an office, and a building for receiving fruit and storing boxes and baskets. After a fire in 1874, the main structure was rebuilt, only to burn again in 1884.

The boiler room had a basement, but other structures in the complex were built on piers or light footings. The second floor of the main cannery building was devoted to a can-making shop. An overhead conveyor system from the factory to the dock below carried goods over the road (now Road 356a) to waiting ships.

Owners:

Brock and Ether Parker
Rudnick and Sons
Jacob Holmes
Delaware Department of Transportation

8. Statement of Significance

Applicable National Register Criteria	D
Areas of Significance	Period of Significance
Commerce	1869-1884

State significance of property, and justify criteria, criteria considerations, and areas and periods of signficance noted above.

The site of the Collins, Geddes and Company cannery is significant under criterion D, because it has yielded important information about the can-making industry at a critical period in its development.

This is the first site at which archæologists have availed themselves of an opportunity to study the industrial process of can manufacture. Because can-making waste lay in an undisturbed, relatively well-preserved deposit, it was possible to reconstruct archæologically the can-making methods during a period between craft tinsmithing and totally machine manufacture.

Archæological tests have determined that the cannery site has not been disturbed since the buildings burned in 1884. The cellar of the boiler room was tested and found to be undisturbed. The entire site west of the can dump has been cultivated, but the only construction is part of a duplex aprartment house that encroaches on the southern edge of the site, away from the site of the main cannery.

The cannery was built in 1869 and burned in 1874 and 1884; the site was then cultivated until a duplex apartment house was built about twenty years ago. Tests demonstrated that the waste pile possesses a very high level of integrity, while the site of the main building has suffered only slight disturbance that is normal in plowed sites.

Background history

The Collins, Geddes cannery was built in 1869-1870 and burned twice, in 1874 and 1884. Like other canneries of the period, it was also a can-making factory.

Most of the two-acre complex consisted of lightly-built wooden buildings, used only during the tomato, peach, and apple canning season from mid-summer to fall. The second floor of the main building was a year-round can facility, where semi-skilled workmen made cans for the next season. An overhead tramway or chute carried cases of acnned goods down the hill from the factory to the wharf below.

Can-makers required charcoal braziers to melt their solder, and the canning process involved steaming and boiling the product. Cannery fires were therefore a constant hazard. Some urban canneries were masonry, but the typical Delaware country cannery was a frame shed, subject to frequent fires.

Waste from can-making was tossed over the side of the bluff, onto property owned by local shipping interests.

After the second fire, the cannery never reopened. The site eventually was reclaimed for farming. About twenty years ago, a duplex apartment house was built on the south half of the site, while the northern part was allowed to grow up in trees.

Archæological investigations

The prehistoric component of this site, previously recorded under the number 7K-C-14, was surveyed by the late H. Geiger Omwake, as well as by local avocational archæologists. Artifacts of the Archaic period are found in the field regularly.

During investigations in advance of reconstruction work on Road 356a, Edward and Louise Heite examined the Collins, Geddes and Company cannery site, which lies along the twenty-foot bluff overlooking the St. Jones River. Test pits on the bluff identified the cellar of the boiler room and features associated with the main cannery building. Chips of chert found in tests throughout the site indicated that the cannery site is superimposed upon the eastern part of the known prehistoric component. Only one point, a tip fragment of brown chert, was found in the testing.

Evidence indicated that the cannery buildings were thoroughly robbed out and demolished. No whole bricks were found among the several deposits of rubble. The cellar hole was intentionally filled with yellow soil, which apparently had been brought from elsewhere for the purpose. There was no evidence that later structures had intruded into the site.

Over the side of the hill was a solid mass of deteriorated tinplate, about forty feet long, three or four feet deep, and ten feet across. This was the waste from can manufacture, thrown over the side between 1870 and 1882, when can manufacture ceased.

Technological context

Tin cans as a method of keeping food were introduced in America about 1818, but canned foods did not immediately find a niche in the grocery market. Cans were expensive, since a canmaker could produce only about sixty cans per day by traditional tinkers' techniques.

By the decade of the Civil War, canmaking had become streamlined. There were stamping machines to shape the ends, shears to cut the sides, and specialized canmaking workbenches that were more efficient than older tinsmiths' general purpose benches.

Each cannery made its own containers, individually and laboriously. Occasional innovations helped to streamilne the process, but it remained a craft throughout the nineteenth century. Each labor - saving innovation slightly de-skilled the process, carying the canmaker farther along the road from skilled craftsmen to industrial operative. By 1880, a team of two workers could produce as many as 1500 cans a day.

True factory production of cans began after 1900, when the Max Ams open-top can machinery was adopted. Within ten years can manufacture had become a separate trade dominated by a few huge companies.

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Wade, Barbara J.
1978 Manufacturing typology for tin containers from the Arctic Salvage Project. Parks Canada *Manuscript Report* 299.

10. Geographical Data

Acreage of property: 2.5 (by deed record)

Verbal boundary Description

Two parcels:

Parcel one consists of a tract 38 feet wide and 231 feet long, parallel to Road 356a, bounded on the eastward by the former course of the road and on the west by parcel two.

Parcel two consists of the original cannery lot, as described in deeds: beginning at a corner stone on a hill and near and old mill race, which was a corner for the land Bennett Dyer bought from Daniel Mifflin; thence along the hill south one-quarter east, 14 poles (231 feet) to a corner of Daniel Mifflin's lot, later of the steamboat company; thence south eighty and three quarters degrees east 2.3 poles (38 feet) to the public road, now Road 356a; then with the road south two and a quarter degrees west six poles (49 feet) to another corner on the road; thence north sixty-nine and three-quarters degrees west 22 poles (363 feet) to a corner post; thence north twenty and one quarter degrees east 18.42 poles (303.9 feet) to a corner on the former mill seat; thence along the mill seat to the beginning, south sixty-nine and three-quarters degrees east 13 poles (214.5 feet).

[Kent County Deed Book N-5, page 486, May 25, 1869, and later deeds]

Boundary Justification

Parcel two is the original cannery lot, on which the buildings stood. Parcel one is part of the former steamboat company lot, where can-making trash was excavated by Heite and Heite. Site boundaries are derived from nineteenth-century deed descriptions.

Form Prepared By

Edward F. Heite
Heite Consulting
P. O. Box 53,
Camden, DE 19934

September 22, 1988
302-697-1789

APPENDIX 4

DELAWARE CANNERY LIST

CANNERIES IN DOWNSTATE DELAWARE were ubiquitous until World War II and the period of transition to frozen foods that followed. Dr. E. D. Bryan, of Dover, who compiled much of the data used in this report, prepared the following list of known Delaware canning establishments. It was first presented to the public in a museum exhibit mounted by the Delaware State Museum, but is here transcribed in a more permanent form.

Successive owners of the same facility are separated by semicolons. A period indicates the end of a particular facility's history.

Sussex County

Angola Neck – Sylvester A. Bookhammer, 1909.

Argo's Corner – Henry M. Ingram, 1914-1919. Horace E. Bennett (3 miles south), 1921-1930.

Atlanta – Perry S. Messick and Son (Norman W.), (of Hurlock, Md.), 1925-1930; Norman W. Messick, 1931-1939.

Bacon [Bacon's Switch] – George Cordrey, 1899. George W. Stradley Canning Co. (of Laurel, Del.), 1914.

Bethel – Phillips & Kraft, 1909; John B. Messick & Co., 1911-1920. Apte Bros. Canning Corp of Delaware, 1935.

Blades – Lloyd Bros. (of Seaford) 1909; Lloyd & Moore Canning Co. (of Seaford), 1913-1918; Allen & Moore Canning Co. (of Seaford), 1919-1923; Cooperative Canners, Inc. (of Seaford), 1924-1927, 1929; Allen Package Co., Inc. (of Seaford), 1930.

Blanchard– Blanchard Canning Co., 1914-1917; Walter M. Wright & Son (James P.) of Preston, Md., 1918-1930.

Bridgeville – Prettyman (James) & Robbins (Samuel), 1867-1870. Wroten & Morris, 1878-1883; J. F. S. Wroten & Co., 1884-1888; Harry Clark, 1889. Henry P. Cannon, 1881-1909; H. P. Cannon & Son, Inc., 1910-1981. George W. Stradley, 1888-1899.

Cannon – Rufus F. Noble & Co. (of Federalsburg, Md.), 1912-1933; T. Sewell Noble (of Federalsburg), 1934-1936; C. Fulton Noble (of Preston, Md.), 1937-1948; Lee W. Noble (of Preston), 1949-1955; Caroline Canning Co. (of Federalsburg), 1956; Elrick & Taylor, Inc., 1963-1970.

Columbia – John S. Cooper & Co., 1909-1932; Columbia Packing Co. (of Delmar, Del.), 1933-1935.

Concord – Concord Canning Co., 1913-1914; Diamond Canning Co., 1915-1916; Carl T. Vincent (of Seaford), 1917-1920; Moore Canning Co. (of Seaford), 1925-1934.

Coolspring – Coolspring Canning Co., 1902-1921.

Dagsboro – Edgar W. Gray, 1908-1910; E. W. Gray & Son, 1911-1924; E. W. Gray Lumber Co., 1925; Brasure & Truitt, 1926-1935. Dagsboro Canning Co., 1906-1910; Rufus D. Lingo & Co., 1914-1919; Williams & Baker, 1925-1929; James Williams, 1930-1931; Timmons & Williams, 1932-1938.

Davis Landing – William Murphy, 1912-1924.

Delmar [Delaware only] – Delmar Canning Co., 1882-1890. James T. Wilson Canning Co., 1909-1921, 1927; A. M Snyder Canning Co., 1928-1931. Delmar Canning Co. (of Aberdeen, Md.), 1909-1919; Delmar Packing Co. (of Aberdeen, 1920-1928, then local), 1920-1939.

Drawbridge – Drawbridge Packing Co., 1874-1880. Willard C. Todd (of Williston, Md.), 1907-1908.

Ellendale – Jester (Benjamin E.) & Reed (Daniel), 1885-1892; Thomas U. Marvel (of Milford), 1893-1894; Benjamin E. Jester, 1895-1900; Ward & Merritt (of Warwick, Md.), 1901; Harry W. Jester & Bro., 1913-1916; Harry W. Jester Canning Co., Inc., 1917-1921; P. J. Ritter Co. (Philadelphia), 1922-1925. William J. Shanahan (of Bel Air, Md., Ellendale Canning Co.), 1908-1910; Shanahan & Archer (of Bel Air), 1911; Shanahan & DeBow (of Bel Air), 1912-1915; M. J. & C. M. Mahan (of Aberdeen, Md.), 1916-1921; Lewis H. Archer (of Joppa, Md.), 1924-1933; John S. Isaacs, 1936-1946; John Isaacs & Sons Farms Inc., 1947-1956. William T. Howeth, 1939. Ellendale Corp., 1942.

Frankford – Bennett & Carr Bros. Co., 1913-1917; Asa Bennett Canning Co., 1918-1924; Frankford Canning Co., Inc., 1925-1937; Apte Bros. Canning Corp. of Delaware, 1938. Showell Manufacturing Co. (of Showell, Md.), 1948-1957.

Georgetown – William H. Lingo, 1875-1880. Georgetown Packing Co., 1876-1883. William A. Faucett & Son (James W.) 1883-1900. George H. Macklin & Co., 1888-1892. Calhoun (George C.) & Thoroughgood (George M. and William J.), 1887-1895. Charles H. Treat & Co., 1885-1890; Robinson & Donovan, 1892-1894; Isaac Robinson (of Baltimore), 1899-1900. Calhoun (George C.) & Jones (Charles R.), 1893-1914; John G. Townsend, Jr., & Co. (of Selbyville), 1915-1972.

Greenwood – J. E. Short & Co. (E. Short), 1888-1889. Samuel Hoey, 1892-1893; John Hoey, 1894-1895; Wilbur L. Hickock & Co. (of Philadelphia), 1896-1901; Samuel S. Bevard (of Wheel, Harford County, Md.), 1902-1906. T. A. Snider Preserve Co. (of Chicago), 1912-1925; Snider Packing Corp. (of Rochester, N. Y.), 1926-1934. R. J. Ledenham & Co., 1911-1912. William Silver Canning Co. (of Aberdeen, Md.), 1908-1910; Ney Carroll (of Havre de Grace, Md.), 1911-1916; Greenwood Canning Co., 1918-1920; Reckord Bros. (M. Atchison, Clinton S., and John G., of Bel Air, Md.), 1921-1928. G. H. Seeley & Son, 1930-1945. Bramble Canning Corp., 1966-1967.

Gumboro – J. Cleveland White (of Salisbury, Md.), managed by John E. Daisey & Son (Walter A.), 1915-1927.

Harbeson – Broadkill (Scarborough) Canning Co. 1902-1907; Roy E. Roberts / Roberts Bros. (Of Baltimore), 1908-1913; Irvin H. Preston & Co. (of Aberdeen, Md.), 1914-1921; William Silver & Co. (of Aberdeen), 1922; Cheswold Canning Co. (of Aberdeen), 1923-1927; W. H. Neal & Sons, Inc. (of Hurlock, Md.), 1928-1935; Neal Canneries, Inc. (of Hurlock), 1936-1938).

Hollyville – William T. Hurdle, 1903-1915.

Laurel – Abraham Anderson (of Camden, N.J.), 1867; William W. Dashiell, 1868. Wright (J. Turpin) & Smith (Joseph F. P. and Samuel T.), 1888-1892, 1895. Isaac Robinson (of Baltimore), 1899; George W. Stradley & Co., 1900-1915. Harry K. Fooks & Co., 1908-1910; W. J. Warren, Laurel Canning Co., 1911-1922. D. W. Campbell, 1910. Hastings (Harvey W.) Packing Co., 1911-1921. Sussex Packing Co., 1918-1919; White Packing Co., 1920; Thomas H. and Elmer E. Riggin, 1921-1922. Delaware Packing Co., 1923; Davis Canning Co., 1924-1930; Oliphant (Harry) Packing Co., 1931-1932; Apte Bros. Canning Corp. of Delaware (of Miami, Fla.), 1933-1936; Phillips Packing Co. (of Cambridge, Md.), 1937-1956. Heckman Products Corp., 1954-1955.

Lewes – Harbeson Hickman, about 1860. Morris (Elihu J.) & Lyons (Laban L.),

1870-1872. Elihu J. Morris & Sons, 1879-1902; Isaac Robinson (of Baltimore), 1898-1900; Alonso F. Anderson (of Havre de Grace, Md.), 1902-1928; Lewes Packing Co. (Baker Family, of Aberdeen, Md.), 1929-1936. Lewes Packing Co. (a different firm), 1913-1922; Hillsboro-Queen Anne Cooperative Corp. (of Maryland), 1934-1939; Charles Mills, 1940-1941. The Doxsee Co., Inc. (of New York), 1954-1987. E. Ney Dodson (of St. Michaels, Md.), 1920-1921.

Lincoln – Lincoln Canning Co., 1874-1879; Abel S. Small & Son (Alphonso W.), 1880-1884; Alphonso W. Small, 1886-1889; Samuel Hoey & Co., 1890; J. T. Jarrell, 1894-1895; Thomas U. Marvel, 1897-1900; Frederica Packing Co., 1904; John W. Bay & Co. (of Perryman, Md.), 1909-1910; Dennis J. Wood (of Princess Anne, Md.), 1911-1914; F. A. Preston & Son (of Havre de Grace, Md.), 1916-1917; William W. Bradford & Co. (of Bel Air, Md.), 1918; John G. Townsend, Jr., & Co. (of Selbyville), 1922-1928. Marie Southard, 1912-1914. Fred H. Whitehead, 1913-1916. Asa A. Taylor (of Aberdeen, Md.), 1909. Edgar F. Isaacs & Sons, 1966-1968.

Midway – Lofland & Vickers, 1909-1912.

Milford (Sussex County) – John W. Cuykendall, 1880, new location 1881; Emanuel Schoenberg & Co. (of Baltimore), 1882-1884; David Reis, 1885-1903; Draper (George H., Sr.) & Hirsch (Daniel), 1904-1912; Draper & Hirsch, Inc., 1913-1914; Draper & Co., Inc., 1920-1959. The Brakeley's, Inc., 1928-1959. Reis (David) & Hirsch (Daniel), 1894-1902; Daniel Hirsch, 1903-1913; D. Hirsch & Bro., 1914-1921. Torsch Packing Co. (of Baltimore), 1909-1920; Torsch-Summers Co. (of Baltimore), 1921-1930; Torsch-Stevenson Corp. (of Baltimore), 1931-1934 (Hillsboro-Queen Anne Cooperative Corp., 1934); Torsch Canning Co., 1935-1968; Jenkins Foods Corp., 1969-1980; Sea Watch International, Ltd., 1981-present. George H. Prettyman, 1910-1928.

Millsboro – Theodore Burton, 1897-1900; Theodore Burton & Son (Fred H.), 1901-1921; W. Blaine Adkins Co. 1923-1939. Henry Barker & Co., 1913-1919; Ryan-Atkins Co., 1920-1922; Collins & Ryan, 1923-1932.

Milton – Reynolds & Co., 1881-1882; Reynolds & Son, 1884. Jacob B. Counselman & Co. (of Houston), 1890-1894; Counselman & Fisher (George L. and John F.), 1895-1897; Fisher & Robinson (Alfred B.), 1898-1899; A. B. Robinson, 1900. Faucett & Co. (of Georgetown), 1893-1899 (also called the Broadkill Packing Co.); Isaac Robinson (of Baltimore), 1900-1901. Ward & Merritt (of Warwick, Md.), 1901-1902; Merritt & Son, 1903-1905; William H. Workman, 1906-1907; Harry R. Draper, 1908-1913; Draper Canning Co., 1914-1970; Draper-King Cole, Inc., 1971-present. Alonzo F. Anderson (of Havre de Grace, Md.), 1901-1928. Royal Packing Co., 1907-1916; E. Ney Dodson (of St. Michaels, Md.), 1917-1921. Goodwin Bros. & Conwell, 1907-1911; Winters & Prophet (of Mt. Morris, N.Y.), 1914-1919; Birdsong Bros. (of New York State), 1920-1922; Milton Canning Co., 1923-1928; Apte Bros. Canning Corp. of Delaware, 1933-1943; Milton Canning Co. (Stafford & Faulkner, Easton, Md.), 1944. Robbins-White Co., 1917-1919.

Nassau – Silver Canning Co. (of Aberdeen, Md.), 1906-1908; Alexander Preston (of Aberdeen), 1909-1911; W. T. & A. Preston (of Aberdeen), 1912-1917; A. Preston's Sons (of Aberdeen), 1918-1922; Cheswold Canning Co. (of Aberdeen), 1923-1929; Nassau Canning Co., 1930-1931.

Oak Grove – Robert W. Messenger (of Federalsburg, Md.), 1909-1910; R. W. Messenger & Co., 1911-1927; Phillips Sales Co., Inc. (of Cambridge, Md.), 1929-1939; Phillips Packing Co. (of Cambridge), 1940-1956. W. & R. Kirwan Inc. (of Cambridge), 1963-1970.

Ocean View – Ocean View Canning Co., 1926-1927.

Overbrook – Alexander Preston (of Aberdeeen, Md.), 1908; William T. & J. H. Preston (of Havre de Grace, Md.), 1909-1913;

Joseph L. & J. Orton Marshall (of Lewes), 1914-1916.

Primehook Neck – Carlton Clifton & Sons, 1948-present.

Redden – A. Thomas Dutton, 1888-1889; Clifton (Paul) & Reed (James C.), 1894; Paul Clifton, 1895.

Rehoboth – Atlantic Canning Co., 1913-1927; Stokely Bros. & Co. (of Louisville, Ky.), 1928-1933, (of Indianapolis, Ind.),.1934-1944; Stokely-Van Camp, Inc. (of Indianapolis), 1945-1964. Lewes Packing Co., 1913-1922. Rehoboth Packing Co., 1913-1923, 1926-1927.

Seaford – Abraham Anderson (of Camden, N. J.), 1867. H. H. Brown, 1868. Daniel Field, 1868. E. Pennington & Co., 1868. Hairgrove & Hopkins, 1868-1870; Henry L. Hopkins, 1871-1880. Benjamin B. Stockley, 1872-1880. Joseph Agular (of Baltimore, Md.), 1882. Miller Bros. (of Baltimore), 1881-1886. Greenabaum Bros. (Alex and Emanuel Greenabaum, Charles Van Leer), 1887-1921; Greenabaum Bros., Inc., 1922-1939; E. Pritchard, Inc. (of Bridgeton, N. J.), 1940-1941. W. H. Stevens & Co., 1889. Morrow & Coulbourn, 1889. Donoho & Co., 1889. Morrow & Coulbourn, 1889. Edgar C. Ross, 1906-1922. H. A. Johnson, 1909. Allen Package Co., 1923; Cooperative Canners, Inc., 1924-1929; Allen Package Co., 1931-1937.

Selbyville – Wyoming Canning Co., 1889. D. W. Campbell, 1909 and 1911; Hastings Bros. 1910; Selbyville Packing Co. (of Girdletree, Md.), 1913-1919. Merrill Bunting & Son, 1914-1921. John G. Townsend, Jr., & Co., 1917-1939. Eureka Canning Co., 1925-1927; Baker (Edward V.) Canning Co., 1928-1939.

Slaughter Neck – Davis (Mark H.) & Draper (George H., Sr.), 1888-1892; Reis (David) & Draper, 1893-1902; George H. Draper, Sr., 1903-1909; George H. Draper & Son, 1910-1913; George H. Draper, Jr., 1914-1958; Draper Foods, Inc., 1959-1978.

Staytonville – Hiram Short, 1881-1883. Hoey Canning Co., 1888. Pemberton Clifton & Son (Fred G.), 1894-1895.

Stockley – Bell (John C.) & Baxter (James H.), 1907-1908; John W. Bay & Co. (of Perryman and Aberdeen, Md.), 1909-1940.

Whitesville – J. Cleveland White (of Salisbury, Md.) managed by M. S. Brittingham, 1915-1926; M. S. Brittingham, 1927-1929.

Wolf's Crossing – William H. Workman & Co., 1908-1913.

Woodland – W. Lee Wheatley (of Federalsburg, Md.), 1905; Torsch Packing Co. (of Baltimore), 1906; W. Lee Wheatley, 1907-1911; J. M. Wright, 1913; Woodland Packing Co., 1914-1919; H. B. Dege (of Seaford), 1923-1927.

Kent County

Bethesda – Abraham B. Stauffer & Son, 1914-1917.

Big Stone Beach – Frank Greco, 1917-1918.

Blackiston – Blackiston Canning Co., 1909-1922, 1927-1929, 1936-1939.

Bowers – Reese (E. C.) & Wilson (Samuel B., of Harrington), 1900-1913; William S. Davidson, 1914-1922.

Brenford – George D. Wright, 1894-1912; George D. Wright & Son, 1913-1914; Elias B. Arnold, 1916-1931; C. Stanley Short, 1936-1939.

Burrsville – W. G. Wooters (of Denton, Md.), 1911-1919. George T. Redden & Son (of Denton), 1917-1919; G. T. Redden & Co. (of Denton), 1920-1921, 1923-1925; Alfred Raughley (of Denton), 1926-1930, 1941-1942; Hillcrest Packing Co. (of Federalsburg, Md.), 1944; Hubert O. Noble (of Federalsburg), 1945-1956. Parker Canning Co., 1946; Parker & Hughes, 1947-1972.

Camden – Stetson & Ellison, 1864-1932; Libby, McNeill & Libby (of Chicago, Ill.), 1933-1934. Carter (William Q.) & Evans (William K.), 1872-1880; William K. Evans, 1882. Humbert & Anderson, 1918; Ford & Co. (of Brooklyn, N. Y.), 1919-

1924; Walter D. Ross Co., Inc. (of Dover), 1925-1927.

Canterbury – Farmers' Fruit Canning & Packing Co., 1874-1878.

Cheswold – Assau, Baines Co. (of Baltimore), 1891-1901; W. F. Assau Canning Co. (of Baltimore), 1902; Frank A. Preston / Preston Bros. (of Havre de Grace, Md.), 1903-1910; Cheswold Canning Co. (of Aberdeen, Md.), 1911-1917; W. T. Preston & Son (of Aberdeen), 1918-1920; Boggs (Edgar J.) & Pearson (Claude H.), 1921-1922. Smith Orchards (of New York City), 1947-1948; Cheswold Canning Co. (division of M. P. Smith & Sons, Inc., of New York City), 1949-1953.

Clayton – Smith & Carsins (of Harford County, Md.), 1880-1889; John W. Carsins, 1891-1897; Charles W. Baker (of Aberdeen, Md.), 1898-1908; Baker (C. W.) & Walls (George A., of Sudlersville, Md.), 1909-1915; Hartly Packing Co. (of Sudlersville), 1916-1919, (of Aberdeen), 1920-1922. John T. Perkins, 1909-1910; Clayton Canning Co., 1913-1923; Clayton Packing Co., 1924-1929; W. Lee Wheatley (of Federalsburg, Md.), 1930-1939; W. L. Wheatley & Son (of Clayton), 1940-1946; W. L. Wheatley, Inc., 1947-1969. Since 1969, when canning ceased, the plant has been a vegetable freezing plant for Campbell Soup Company.

Dover – Richardson & Robbins, 1856-1975 (after 1959 subsidiary of William Underwood Co., Watertown, Mass.). Joseph M. Chambers, 1871-1880; J. M. Chambers Packing Co., Inc., 1881-1895; Edgar N. Baker, 1896-1900. Charles M. Scott Packing Co., 1906-1922; West Dover Farmer Packers Inc., 1923-1931; United Producers Inc., 1932-1934; Haas Production, Inc., 1935-1936. Liberty Brand Canning Co., 1908-1921; Delaware Packing Co., 1922-1924; Kent Packing Co., 1927; Scott & Daly, Inc., 1929-1931. F. Romeo & Co. (of New York City), 1917-1933. Harris Preserving Co., 1947-1953.

Draper's Corner – Benjamin C. Draper, cannery and saw mill, 1908-1910.

Edwardsville – Louder S. Edwards, 1907-1908.

Farmington – Nicholas R. Johnson & Co. (with Edward W. Russell and William H. Murphey), 1884-1888; The N. R. Johnson Co., Inc., 1889-1903. Charles H. Simmons & Co., 1906-1913; Riley Packing Co., 1914-1916; Henry B. Messenger & Co. (of Federalsburg, Md.), 1917-1921; Felton Packing & Manufacturing Co. (of Felton, Del.), 1925-1928. R. W. Knotts, 1920. Ebe W. Waples &Co., 1882-1884; Hiram Short, 1885-1889; James C. Reed, 1890-1891; Simmons & Co., 1892; The Simmons Manufacturing Co., 1893.

Felton – Peck (Samuel L.), Friedel (Jacob) & Co. (with John Heyd), 1873-1880. Peck, Clifton (Robert) & Co., 1881-1887; Reed (James C.) & Killen (Thomas E.), 1888-1889; G. H. Killen & Co., 1890-1892; Simpkins (Stephen G.) & Harrington (Walter J.), 1893-1895; Alvan B. Conner (Felton Packing Co.), 1896-1919 (Isaac Robinson of Baltimore, 1899, 1914-1916); Felton Packing and Manufacturing Co., 1920-1931 (thereafter a series of poultry packers, ending with Purdue, Inc.). Jarrell (James T.) & Peck (Samuel L.),. 1882; J. T. Jarrell, 1888; James C. Reed, 1889-1895; Melvin (Riley), Schabinger (William) & Rice (Charles), 1904-1908; Schabinger & Rice, 1909-1915. Minner (Samuel), Heyd (John), Dill (Alfred) & Hughes (Carl), 1907-1908. Charles F. Sipple, 1910-1912.

Fork Landing – Cyrus P. Rogers, 1872-1908.

Frederica – Samuel W. Hall (Eagle Packing Co.) 1872-1880; Reynolds (Robert W.) & Postles (James T.), 1881-1889; Robert W. Reynolds, 1890; Hydorn, McKnitt & Reynolds, 1891-1892; McKnitt & Reynolds, 1893; John S. Reynolds, 1894-1901; American Packers Assn., 1902; John S. Reynolds & Co., 1903-1920; Willard M. Harris (of Wyoming, Del.), 1924-1928; Frederica Packing Co., 1931-1941; Draper Bros. (of Milford, Del.), 1942-1968. Henry A. Reik & Co., 1887-1897; Rufus M. Gibbs Preserving Co. (of Baltimore), 1898-1901; Swingley (Joseph

A.) & Arthur (Daniel B., of Harford County, Md.), trading as Frederica Packing Co., 1902-1905. Hydorn & McKnitt, 1888-1889. James T. Postles, 1891-1908; William Numsen & Son, Inc. (of Baltimore), 1911-1927; W. H. Neal & Sons,. Inc. (of Hurlock, Md.), 1930-1935; Neal Canneries, Inc. (Hurlock), 1936-1937; The Frederica Packing Co., 1938-1941; Draper Bros. (of Milford), 1942-1968.

Harrington – Sharp (William T.) & Quillen (William C.), 1879-1883; James C. Reed, 1884-1889. Fleming Canning Co. (Henry C. and Ezekiel Fleming and John W. Sheldrake), 1891-1901; American Packers Assn., 1902; Fleming Canning Co., 1903-1905; John W. Sheldrake, 1906-1923; Harrington Packing Co. (Fred Satterfield and Byron McKnatt), 1924-1929. Harrington Canning Co., 1912-1920; Ridgely W. Vane Packing Co., 1923-1939 (sublet to F. G. Favaloro Sons Inc., New Orleans, 1930-1931); Harrington Canning Co., 1940-1956. Isaac Robinson (of Baltimore), 1900. William A. Smith & Co., 1896-1899. S. P. Reese & Co., 1900-1921. E. C. Reese & Co., 1909-1935.

Hartly – Baker & Walls (of Sudlersville, Md.), 1911-1913; Hartly Packing Co. (of Sudlersville, 1914-1919, and Aberdeen, Md., 1920-1922), 1914-1922; W. H. Neal & Son Co. (of Hurlock, Md.), 1923-1928; W. H. Neal & Sons, Inc. (of Hurlock), 1929-1935; Neal Canneries, Inc. (of Hurlock), 1936-1938. William Temin & Son, 1914-1916. Warner Van der Velde, 1914-1919.

Hazlettville – John W. Bloth, 1912-1916.

Hickman – William R. Breeding (of Federalsburg, Md.), 1905-1918; W. R. Breeding & Son (W. Ford Breeding), 1919-1921; John E. Elrick (of Federalsburg), 1923-1939.

Hill's Store (Now Thompsonville) – George M. Howell, 1882; Thompson & Hill, 1883.

Hopkins Cross Roads – Benjamin H. McKnatt & Bro. (Alexander), 1911-1913.

Houston – The Houston Packing Co. (David Scott & Co.), 1879-1884; Thomas J. Meehan (of Baltimore), 1885; Jacob B. Counselman & Co., 1886-1893; Zachariah Johnson, 1894-1899; Johnson Bros. & Co. (Zachariah, Jr., John H. and William J.), 1900-1901; American Packers Assn., 1902; Johnson Bros., 1903-1914. Houston Packing Co. (not the same as above; operated by George L. Counselman), 1885-1908. Stetson & Ellison (of Camden), 1912-1932; Libby, McNeill & Libby (of Chicago), 1933-1968.

Kenton – Joshua M. Arthurs, 1882-1888; G. N. Armstrong & Bro., 1889-1890; Carsins & Maxwell (of Harford County, Md.), 1891-1892; John W. Maxwell, 1893; Charles W. Baker (of Aberdeen, Md.), 1894-1907; E. C. Bayless (of Aberdeen), 1908-1909; Baker & Walls (of Sudlersville, Md.), 1910-1919. Kenton Tomato Packers Assn., 1923-1926. Leonard Biger, 1914-1922; Kenton Canning Co. (Leonard F. Biger and Howard W. Hilyard), 1923-1929; John W. Arthurs, 1930-1935; Kenton Packing Co., 1940-1944; Kenton Canning Co., Inc. (of Ridgely, Md.), 1946-1947; Leonard F. Biger, 1948; Biger & Cole Canning Co., Inc., 1949-1951. J. G. Van Holten & Sons, Inc. (of Milwaukee, Wisconsin), 1949-1954.

Lebanon – Collins, Geddes & Co., 1869-1871; John S. Collins & Co., 1872-1874; Delaware Fruit Packing Co., 1875-1877; Thurber & Co. (William A. Parshall of New York City), 1878-1879; William E. Cotter, 1880-1882.

Leipsic – Samuel W. Hall (of Dover), 1881; S. H. Levin's Sons (of Philadelphia), 1882-1901; American Packers Assn., 1902; S. H. Levin's Sons, 1903-1913; Richardson & Robbins (of Dover), 1914-1939. Harry Raymond, 1906-1908. Ford (Harry) & Wilson (Edward S.), 1909-1914.

Little Creek – Little Creek (Bay View) Fruit & Vegetable Canning Co., 1873-1880; Delaware Fruit Packing Co. (William S. Heverin, William E. Cotter, Joshua McGonigal), 1881-1883. J. Thomas

Lowe, 1894-1898; Isaac Robinson (of Baltimore), 1899-1900; Walter S. Hendrickson, 1901-1907. Derrickson (Joshua W.) & Martin (Frank) of Dover, 1912-1931.

Magnolia – Connor (John B.) & Scotten (George P.), 1911-1912; George P. Scotten & Son (J. Lester), 1913-1917; Magnolia Packing Co. (of Federalsburg, Md.), 1919-1946; J. Richard Phillips, Jr., & Sons, Inc. (of Berlin, Md.) 1947-1970.

Marydel – Wesley Temple, 1872; William Knowles, 1879; Frank G. Slemmer, 1881-1888. Marydel Canning Co. (Collins, Heverin & Co.), 1874. Casey Canning Co. (of Hartly, Del.), 1914-1917. J. H. Preston & Son (of Harford County, Md.), 1902. Elmer Bowdle, 1915-1920. T. Olin Ford, 1915-1918. W. S. Thomas, 1915-1919. L. A. Covell Co., 1945-1957; H. P. Cannon & Son, Inc. (of Bridgeville, Del.), 1958-1959; San Del Packing Co. (of Sandtown, Del.), 1960-present.

Masten's Corner – William M. Minner, 1905-1919. James Townsend, 1906-1910; James Townsend & Son, 1911-1931.

McCauley's Pond – James L. Smith & Bro., 1882-1888.

Milford (Kent County) – Brown (James) & Matthews (Solomon), 1857-1860. Samuel W. Hall (of Frederica), 1878; George M. Howell (of Trenton, N. J.), 1879-1882; John W. Cuykendall, 1883; John Dana (of Belpre, Ohio), 1884-1886; J. Alexander Harris, 1888-1889; James C. Reed (of Harrington), 1890; Reed & Clark (Samuel A.), 1891-1896; George S. Grier & Son (Robert D.), 1898-1904; Torsch Packing Co. (of Baltimore), 1905-1908. Jenkins (Silas T.) & Rhodes (John N.), 1881-1883. Wilbur Masten, 1898. Milford Packing Co., Inc., 1945-1974.

Petersburg – Petersburg Preserving Co. (William J. and Winfield Chambers), 1908-1913; William J. Chambers, 1914-1915. George Nechay & Sons (of Goldsboro, Md.), 1949-1960.

Rising Sun – Farmers' Fruit Preserving Co., 1872-1886; Farmers' Preserving Co. (reincorporated under new name), 1887-1913; Liberty Brand Canning Co. (of Dover), 1914-1921; Delaware Packing Co., 1922.

Sandtown – Willard Hickman, 1908-1916; Temple Smith & Co. (of Greensboro, Md.), 1917-1919; Harry A. Roe (of Denton, Md.), 1926-1928. A. Anderson (of Goldsboro, Md.), 1911-1914. George Nechay & Sons, 1946-1959; San Del Packing Co., 1960-present.

Slaughter – Robert A. Davis, 1898-1900.

Smyrna – Joseph V. Hoffecker, 1867; Hoffecker & Bro., 1868-1875; John H. Hoffecker Canning Co., 1877-1934; Harford County Canning Co., 1935-1937. A. N. McGaw & Bro. (of Aberdeen, Md.), 1888-1891; Charles Osborn & Bro. (Luther S., of Aberdeen), 1892-1898. Diamond State Conserving & Pickling Co., 1883-1885. Mrs. Peterson Speakman & Son Packing Co., 1909-1916.

Smyrna Landing – J. B. Counselman & Co., 1894-1901; C. H. Pearson Packing Co. (of Baltimore), 1902-1903; Torsch Packing Co. (Baltimore), 1904; Hoffecker Bros. & Hall, 1905-1908; Hoffecker Bros. & Hall Co., Inc., 1909-1917.

Vernon – Jonathan L. Hopkins, 1907-1936; F. P. Parker, 1941-1942; Hillcrest Packing Co. (of Federalsburg, Md.), 1943-1944; Vernon Packing Co. (of Federalsburg), 1946-1956.

Viola – Postles & Harrington, 1883. Viola Canning & Preserving Co., 1908-1919; Viola Canning Co., 1920-1925; Felton Packing & Manufacturing Co. (of Felton, Del.), 1926-1928.

Webb's Landing – Benjamin H. McKnatt (of Harrington, Del.), 1909. Schuyler Kirby, 1907-1910.

Williamsville – Zachariah Johnson, 1884-1906.

Willow Grove – Henry Cowgill, 1862-1864. J. Marion Wilkinson, M.D., 1882. J. Colby Smith & Son (Harry H.) 1894-1920.

Woodside – Lily Lake Packing Co., 1881-1883; Samuel H. Derby & Co., 1884-1915. John W. Cuykendall (with John J. Roosa) & Co. (of Milford), 1882; Thomas P. Anderson / Anderson Brothers, 1883-

1898; Isaac Robinson (of Baltimore), 1899-1900; Wells (John F.) & Bonnett (Ernest W., of Aberdeen, Md.), 1902-1906; Luttrell (William T.) & Delevett (James M., of Philadelphia) 1907-1912; Woodside Packing Co. (of Philadelphia), 1913-1914; Derrickson (Joshua W.) & Martin (Frank, of Dover), 1915-1931; Apte Bros. Canning Corporation of Delaware (of Tampa, Florida), 1935-1944; Apte Canning Sales Co., 1946; J. William Horsey Corp. (of Tampa, Florida), 1947; Green Giant Corp. (of Minnesota), 1953-1968. Woodside Canning Co., 1950-1953. Paramount Canning Co. (of Haines City, Florida), 1950-1952.

Wyoming – Dewoody (David G.) & Taylor (George H.), 1872. Brown (Jacob G., Christian G., Abraham N.) & Hansen (Thomas P.), 1880-1888; Conwell & Co., 1889; B. Sullivan & Co., 1890; James V. McCommons, 1891-1895; Charles W. Baker (of Aberdeen, Md.), 1896-1911; Stetson & Ellison (of Camden), 1914-1932; Libby, McNeill & Libby (of Chicago), 1933-1970. John A. Downham, 1912-1913; John A. Downham & Son, 1914-1919; Downham & Co., 1920-1922; Farmers' Packing Co., 1923-1925; Downham & Co., 1926-1929. Domestic Science Canning Co. (of New York City), 1914-1917; Franklin Preserving Co. (Delaware Fruit Co., Inc.), 1918-1928. Willard M. Harris, 1912-1919; W. M. Harris & Sons, 1920-1934.

New Castle County

Arden – Brandywine Mushroom Corp. (of West Chester, Pa.), 1936.

Armstrong – Mar-Del Canning Co. (of Sudlersville, Md.), 1912-1916; James S. Middleton III (of Aberdeen, Md.), 1917-1921; Armstrong Packing Co. (of Aberdeen), 1922-1929; Harford County Canning Co. (of Aberdeen), 1941; Wheatley (W. Lee) & Cole (Harvey G., of Clayton, Del.), 1942-1943; H. G. Cole Canning Co., Inc., 1944-1964.

Bear – Joseph T. Gough, 1912-1914.

Blackbird – Charles W. Pancoast (of Delaware City), 1907; Pancoast Canning Co., 1908-1909; Mortimer Records, 1910-1912; M. Records' Sons Co., 1913-1917; E. M. Records & Co., 1918-1927; Justright Canning Co., 1928-1938.

Delaware City – John H. Fromberger, M.D., 1850. William G. Knowles (of Philadelphia), 1874; Sleeper, Wells, & Aldrich (of Burlington, N.J.), 1875-1876; William E. Cleaver, 1877-1885; Anderson Preserving Co. (of Camden, N. J.), 1888-1890; J. B. Stansbury Son & Co. (of Baltimore), 1891-1904. Charles W. Pancoast, 1890-1909. Mincemeat factory, George W. Craig, 1878; William Beck, 1879-1880s; Beck & Pancoast, 1891. Starr Bros. Cannery Co. (of Salem, N. J.), 1898-1899.

Eagle's Nest Landing – Samuel A. Fortner, 1912-1925.

Fleming's Landing – Smith (John H.) & Burkley (George F., of Aberdeen, Md.), 1909-1913; Smith, Burkley & Billingslea (Eugene), 1914-1919.

Green Spring – Thomas D. Miller & Co. (of Havre de Grace, Md.), 1912-1917; Seth B. Taylor (of Aberdeen, Md.), 1918-1921; Harry T. Preston (of Havre de Grace), 1923-1928.

Hockessin – Hockessin Food Products Co., 1942-1970. Tim's Packing Co., Inc., 1966-1967. Hockessin Mushroom Products, Inc., 1978-present.

Middletown – Biggs, Clayton & Co. (W. P. Biggs, Henry Clayton, Joshua Clayton, Charles S. Ellison), 1882-1884. James T. Shallcross, 1882. Harry L. Arthur (of Aberdeen, Md.), 1886-1890. Wells, Herring & Co. (of Aberdeen), 1888-1895. Jacob B. Maxwell, 1887-1889; James H. Preston & Co.(of Havre de Grace, Md.), 1891-1906; Preston Bros. (Samuel W. and Harry T., of Havre de Grace), 1907-1911; Harry T. Preston, 1912-1919; G. Harold Baker (of Aberdeen), 1920-1921; Morning Star Packing Co., 1924-1932. James B. Baker (of Aberdeen), 1909-1912; G. Harold Baker (of Aberdeen), 1913-1934;

G. H. Baker, Inc., 1935-1939; Harford County Canning Co. (of Aberdeen), 1940.

Mount Pleasant – Harry P. Strasbaugh (of Aberdeen, Md.), 1914-1925.

Newark – Amos Thompson (of Havre de Grace, Md.) 1895-1909; Snyder Co., 1910-1912; Newark Canning Co. (Harry A. Gilbert of Aberdeen, Md.), 1913-1915; P. J. Ritter Co. (of Philadelphia), 1915-1921; United Canneries Corp., 1922-1924; United Packing Co., 1925-1928. Claude P. Hearn, 1932-1935. Phillips Packing Co. (of Cambridge, Md.), 1931-1954.

Odessa – Watkins Packing Co. (Columbus Watkins, Sr. and Jr., and J. W. Watkins), 1881-1942. James Baker (of Aberdeen, Md.), 1888-1891; Baker Bros. (William B. and J. B., of Aberdeen), 1892-1900; William B. Baker, 1906-1910; H. R. Baker (of Aberdeen), 1912-1930; G. Walter Smith (of Aberdeen), 1931-1934; Odessa Canning Co., 1935-1936; Victor C. Carroll (of Aberdeen), 1937; James S. Middletown (of Aberdeen), 1943-1946; Odessa Canning Co., 1947. Odessa Foods, Inc., 1954-1956. Gioia Specialty Foods, Inc., 1965-1966.

Porter's Station – Charles Osborn (of Aberdeen, Md.), 1899-1910.

Port Penn – Read Gordon, 1846. Dilworth (Thomas F.) and Stewart (T. D.), 1878-1889; Thomas F. Dilworth, 1891-1896; Martin Lane, 1897-1899; Robert K. Neff & Co. (of Philadelphia), 1900-1901; American Packers Assn., 1902; R. K. Neff & Co., 1903-1905; Kemp-Thomas Packing Co. (of Baltimore), 1906-1919. John S. Zacheis, 1913-1914; William B. and John S. Zacheis, 1915-1922; W. B. & J. S. Zacheis, Inc., 1923-1944; Harford County Canning Co. (of Aberdeen, Md.), 1945; Stevenson-Campbell Canning Co., 1946; Port Penn Canning Co., 1947-1956.

St. Georges – St. Georges Fruit Packing Co., 1883-1895; St. Georges Canning Co., 1896-1907; Charles W. Pancoast Canning Co, 1908-1916; St. Georges Canning Co., 1917-1927; Claude N. Lester, 1928-1936; St. Georges Canning Co., 1937-1970.

Silverbrook – White & Bro., 1903-1905. Delaware Mushroom Cooperative Assn., 1946-1964; American Mushroom Corp., 1965-1975.

Taylor's Bridge – Smith (John H.), Burkley (George F.), & Billingslea (Eugene, of Aberdeen, Md.), 1914-1919; Smith, Burkley & Waream (Walter W., of Aberdeen), 1924-1934.

Townsend – Samuel Townsend, 1863-1869. Hanson & Clayton, 1882. George E. Wright Packing Co. (of Aberdeen, Md.), 1904-1909; Wright Canning Co. (of Aberdeen), 1911-1923; Edward M. Records & Co., 1924-1927; Justright Canning Co., 1928-1938; Phillips Packing Co. (of Cambridge, Md.), 1940-1956. Townsend Canning Co., 1906-1908.

Vandyke – Mortimer Records' Sons Co., 1914-1917; Edward M. Records & Co., 1917-1927; Justright Canning Co., 1928-1938.

Wilmington – Duncan (W. P.) & Jones (Robert H.), 1866. John Moir & Son, 1882-1887. Franco-American Food Co. (of New York City), 1889. Taīt (John) & Neil (Robert), 1883; Wilmington Canning Co., 1884-1885.

APPENDIX 5

QUALIFICATIONS OF THE INVESTIGATOR

Edward Heite served as Historic Registrar and Chief of the Bureau of Archives and Records Management for the State of Delaware. His assignments with the state included the statewide survey of historic sites and the restoration of the Old State House at Dover. He was previously archæological historian for the Virginia Historic Landmarks Commission, for whom he directed the excavation of eighteenth-century Fredericksville Furnace and the seventeenth-century Hallowes site in Virginia.

Since 1980, Mr. Heite has completed reconnaissance-level studies and phase I studies for the Philadelphia District, United States Army Corps of Engineers, National Park Service, United States Navy, Waste Management of North America, BCM Eastern, Inc., the Trustees of the New Castle Common, and the Delaware Department of Transportation.

Mr. Heite is a member of the Society of Professional Archæologists, certified in theoretical/archival research, historical archæology, documentary research, field research and cultural resource management. He meets the professional standards for both historians and archæologists set forth in 36 CFR Part 61 and 43 CFR Part 7 (1984) and in the Secretary of the Interior's standards and guidelines for archæology and historic preservation (*Federal Register* Thursday, September 29, 1983, pages 44738-44740).


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